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FLOOD INSURANCE STUDY



COUNTY OF HANCOCK,
INDIANA
UNINCORPORATED AREAS



APRIL 15, 1982



Federal Emergency Management Agency

COMMUNITY NUMBER · 180419

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Flood Boundary and Floodway Map Index
Flood Boundary and Floodway Map

PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index
Flood Insurance Rate Map

FLOOD INSURANCE STUDY
COUNTY OF HANCOCK, INDIANA
UNINCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Unincorporated Areas of Hancock County, Indiana, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study will be used to convert Hancock County to the regular program of flood insurance by the Federal Emergency Management Agency (FEMA). Local and regional planners will use this study in their efforts to promote sound flood plain management.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than those on which these Federally-supported studies are based. These criteria take precedence over the minimum Federal criteria for purposes of regulating development in the flood plain, as set forth in the Code of Federal Regulations at 44 CFR, 60.3 (d). In such cases, however, it shall be understood that the state (or other jurisdictional agency) shall be able to explain these requirements and criteria.

1.2 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by Snell Environmental Group, Inc. for the Federal Emergency Management Agency, under Contract No. H-4777. This study was completed in December 1980.

1.3 Coordination

Streams requiring detailed study were identified at a meeting attended by representatives of the Study Contractor, FEMA, the Indiana Department of Natural Resources (IDNR) and representatives of Hancock County in April 1978.

Information regarding flood flow and flood elevations for Buck Creek was obtained from the U.S. Army Corps of Engineers (COE), Louisville District. Discussion and data on historic floods were coordinated with both the IDNR and the U.S. Geological Survey (USGS) in Indianapolis, Indiana. Precipitation data for historic floods were obtained from the National Climatic Center in Asheville, North Carolina. Results of the hydrologic

analysis were coordinated by the IDNR with the USGS, the COE and the U.S. Soil Conservation Service (SCS). Flood elevations and floodway delineation were coordinated with the IDNR.

On December 8, 1981, the results of the work by the Study Contractor were reviewed and accepted at a final coordination meeting attended by representatives of the Study Contractor, FEMA, and the community.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the unincorporated areas of Hancock County, Indiana. The area of study is shown on the Vicinity Map (Figure 1).

The areas studied by detailed methods were selected with priority given to all known flood hazard areas, and areas of projected development or proposed construction through August 1985.

Approximate methods of analysis were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to and agreed upon by FEMA and Hancock County.

The limits of detailed and approximate studies in Hancock County were determined by FEMA and IDNR, with community and Study Contractor consultation at the meeting in April 1978. Streams studied in detail are shown in Table 1.

Flooding on portions of the following streams were studied by approximate methods: Sugar Creek; Brandywine Creek; Jackson Arm Ditch; Jay Ditch; Stansbury Ditch; Dry Branch; North Fork; Rash Ditch; Flatfork Creek; Bills Branch; Richey Ditch; Wilson Ditch; Dunwoody Ditch; Pee Dee Ditch; Village Brook; Ham Ditch; Harlan Run; Maite Run and Brier Arm.

2.2 Community Description

Hancock County is located in central Indiana, approximately 10 miles east of Indianapolis. The county is bordered by Madison and Hamilton Counties to the north, Henry and Rush Counties to the east, Shelby County to the south and Marion County to the west. The total land area contained within the county is 313.8 square miles. The 1977 population was 41,500, an 18.2 per cent increase from the 1970 population (Reference 1).

The climate in central Indiana is classified as continental. It is primarily influenced by eastward moving masses of cold polar air from the north and

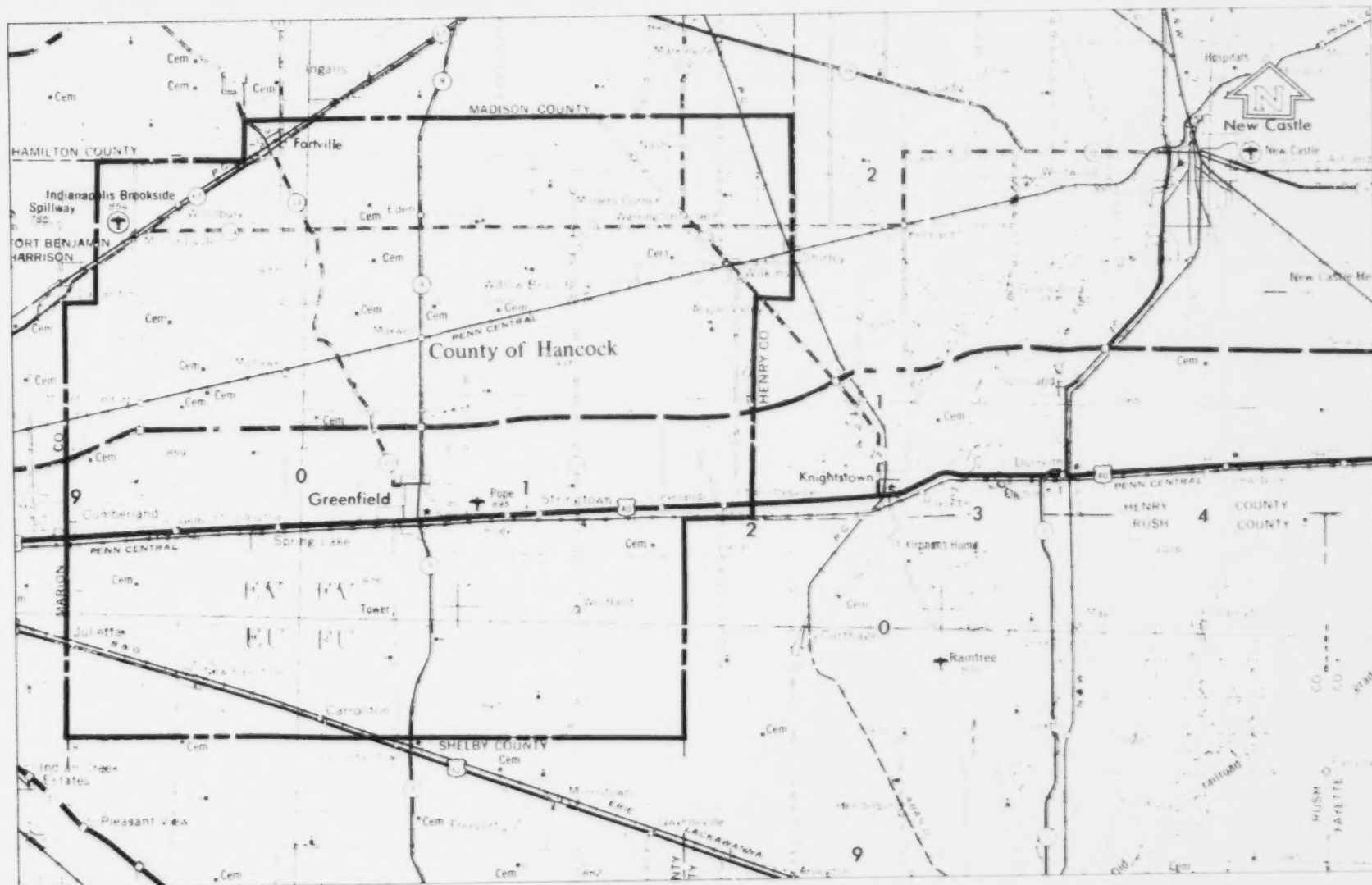


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

APPROXIMATE SCALE



VICINITY MAP

TABLE 1: FLOODING SOURCES

<u>DETAILED FLOODING SOURCES</u>	<u>DESCRIPTION OF STUDY LIMITS</u>		<u>Distance (Miles)</u>
	<u>FROM</u>	<u>TO</u>	
Buck Creek	County Line Road	State Route 234	11.6
Doe Creek	County Line Road	About 2,250 feet upstream County Road 200 South	4.6
Brier Creek	County Line Road	2,300 feet upstream of County Road 700 West	2.4
Sugar Creek	County Road 600 South (Southern county boundary)	State Route 234	18.5
Big Blue River	About 1.1 miles downstream 575 East Road	County Road 1,000 West	4.7
Six Mile Creek	Mouth at Big Blue River	County Road 1,000 West (3rd crossing)	3.3
Little Sugar Creek	About 2,500 feet downstream County Road 600 South	County Road 200 South	9.0

warm gulf air from the south. Mean monthly temperatures range from 30.7 degrees Fahrenheit (F.) in January to 75.9 degrees F. in July. Average annual precipitation of the region is 39.1 inches with slightly higher amounts occurring in the spring and early summer than the remainder of the year (Reference 1).

Hancock County is characterized by gently rolling to nearly flat topography. Approximately 90 per cent of the county is agricultural land, mainly corn, soybeans and wheat. Four per cent of the county has been developed. An additional five per cent of the land is forest.

Seventy-three per cent of the soils in Hancock County consist of the Crosby-Brookston soil association. These soils are characterized by poorly drained, level silt-loams and very poorly drained silty-clay loams on uplands. Seventeen per cent of the soils consist of the Miama-Crosby soil association, characterized by well-drained and somewhat poorly drained soils occurring in rolling uplands and at breaks between the uplands and the bottomlands, paralleling major streams. Ten per cent of the soils are Ockley-Sloan-Shoals soil association, characterized by well drained, somewhat poorly drained and very poorly drained soils found at nearly level bottomlands along streams (Reference 2).

Streamflow in Hancock County is drained in a northeast-to-southwest direction. The major streams in the county are Big Blue River and Sugar Creek with drainage areas 260 and 94 square miles, respectively, at the southern county line.

Buck Creek is a tributary to Sugar Creek flowing southwest into Marion County. At the western Hancock County line, the drainage area is 22 square miles. Doe and Briar Creeks flow into Buck Creek. At the southern Hancock County line, both creeks have a drainage area of 5.2 square miles. Little Sugar Creek, also known as Wilson Ditch, is a tributary to Sugar Creek and flows south into Shelby County. At the southern Hancock County line, the drainage area is 26 square miles.

The flood plains in Hancock County remain mainly undeveloped.

2.3 Principal Flood Problems

The history of flooding on the streams within Hancock County indicates that flooding may occur during any season of the year. The majority of large floods have occurred between late winter and early summer.

There have been a number of major floods on the Big Blue River and Sugar Creek this century. The highest floods on the Big Blue River occurred in 1913; March 1963; January 1949; and February 1950. The 1913 flood is the flood of record; however, no discharge was recorded. The discharge at the Shelbyville gaging station (No. 03361500, years of record 1943 to present) for the 1963, 1949 and 1950 floods is 15,800 cubic feet per second (cfs), 14,800 cfs and 12,500 cfs, respectively. The estimated return period for

floods of these magnitudes is 25 years, 20 years and 10 years, respectively. At the Carthage gaging station (No. 0336100, years of record 1950 to present) the discharge recorded for the 1963 and 1949 floods is 12,900 cfs and 5,750 cfs, respectively, with corresponding return periods of 90 years and three years (Reference 3).

Major floods on Sugar Creek have occurred in 1956, 1968, 1969 and 1955. The discharge at the Edinburg gaging station (No. 03362500, years of record 1942-present) for these floods is 27,600 cfs, 19,900 cfs, 19,300 cfs and 18,200 cfs and corresponding return periods are 63 years, 14 years, 13 years and 10 years, respectively. The May 1956 flood is the most recent severe flood occurring in Hancock County. Approximately six inches of rain fell over three days, causing families to evacuate, levees and bridges to fail, and rendering highways impassable. Upstream of Youngs Creek, the Sugar Creek peak flow reached 25,000 cfs, that of a 100-year flood. While no other tributaries to Sugar Creek had streamflow recorders at the time, a number of peak flow estimates were made for the 1956 flood by the USGS using the "method of width contractions" (Reference 4). The 1956 flood peak discharge for Buck Creek at Cumberland, where the drainage area is 21.7 square miles, was estimated to be 6,960 cfs. The estimated peak discharge for Little Sugar Creek, for a drainage area of 14.2 square miles, at Pleasant View is 6,900 cfs. These discharges correspond to return periods of 150 years and 800 years, respectively. No flood records are available for Doe Creek or Brier Creek.

2.4 Flood Protection Measures

An "Upper Big Blue River Flood Control Project" is currently in progress in Henry County by the SCS. Thus far, nine structures have been or are very close to being in operation, thus, the effects of these structures were included in this report. Two future structures controlling 22.35 square miles on Montgomery Creek and 23.14 square miles on Duck Creek are planned for operation in four to five years. The effects these structures may have on the Big Blue River flood flow have not been included in this study. A multi-purpose flood control project by the COE, Big Blue Lake, is proposed upstream of the study area on the mainstem of the Big Blue River. This project is still in the early planning stages and would control approximately 50 per cent of the drainage area above Shelbyville but was not considered in this study. No other flood protection structures exist or are planned for Hancock County.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equalled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance premium rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 per cent chance, respectively, of being equalled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a

specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than one year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (one per cent chance of annual occurrence) in any 50-year period is about 40 per cent (four in ten), and for any 90-year period, the risk increases to about 60 per cent (six in ten). The analyses reported here reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each flooding source studied in detail affecting the community.

For the Big Blue River, the discharges are based on a statistical analysis of discharge records at the Shelbyville and Carthage gaging stations (Nos. 03361500 and 0336100) (Reference 3). This analysis followed the standard log-Pearson Type III method as outlined by the Water Resources Council (Reference 5). Flood discharges for Sugar Creek were obtained by a regional analysis of stream gages for similar watersheds in surrounding basins according to Bulletin No. 17 (Reference 5). Doe and Brier Creeks flood discharges are also based on a regional stream gage analysis. Buck Creek discharges were previously coordinated for the Flood Insurance Study in Marion County by the COE, Louisville District (Reference 6). These discharges were extrapolated and used in Hancock County. Flood discharges for Little Sugar Creek and Six Mile Creek were determined using the TR-20 computer program developed by the SCS (Reference 7). The TR-20 program determines peak flows from rainfall data based on the basin characteristics such as drainage area, stream slope, soil cover, vegetation and land use characteristics.

Peak discharges for the 10-, 50-, 100-, and 500-year floods of each flooding source studied in detail in the community are shown in Table 2.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the streams in the community were carried out to provide estimates of the elevations of the floods of the selected recurrence intervals along each flooding source studied in detail.

Cross sections for the backwater analysis of the streams studied in detail were obtained in 1979 by field survey and from aerial photographs at a negative scale of 1:7920 (Reference 8). All bridges, dams and culverts were field measured to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles. For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Boundary and Floodway Map.

TABLE 2 - SUMMARY OF DISCHARGES

<u>FLOODING SOURCE AND LOCATION</u>	<u>DRAINAGE AREA</u>	<u>PEAK DISCHARGES (CFS)</u>			
	<u>SQ MILES</u>	<u>10-YEAR</u>	<u>50-YEAR</u>	<u>100-YEAR</u>	<u>500-YEAR</u>
BIG BLUE RIVER					
At County Road 600 South	269	10,000	14,000	16,000	18,300
Just upstream of confluence of Nameless Creek	243	9,500	13,200	15,000	17,300
Just upstream of confluence of Six Mile Creek	196	8,400	11,800	13,300	15,400
SUGAR CREEK					
Just upstream of confluence of Little Sugar Creek	95.7	7,500	11,000	12,600	16,600
At New Palestine corporate limits	93.9	7,400	10,800	12,300	16,200
Just upstream of confluence of Smith and Johnson Ditch	85.4	7,000	10,300	11,800	15,500
At County Road 200 North	75.8	6,500	9,600	11,000	14,200
At State Route 13	67.1	6,000	8,800	10,100	13,300
At State Route 234	50.0	5,100	7,500	8,600	11,300
BUCK CREEK					
At County Line Road	22.9	4,550	6,650	7,650	10,500
Just downstream of confluence of Lead Creek	21.4	4,450	6,500	7,500	10,300
Just upstream of confluence of Snider Branch	19.4	4,300	6,200	7,100	9,900
Just upstream of confluence of Burris Ditch	17.5	4,100	5,900	6,800	9,400
At County Road 300 North	14.4	3,700	5,400	6,200	8,600
At Conrail	11.9	3,400	5,000	5,700	7,900
At County Road 500 North	8.7	2,950	4,350	5,000	6,900
Just upstream of confluence of Jones Ditch	5.4	2,400	3,500	4,000	5,500
At County Road 700 North	3.2	1,900	2,800	3,200	4,300
At County Road 300 West	2.5	1,670	2,440	2,790	3,800

TABLE 2 - SUMMARY OF DISCHARGES (Continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA	PEAK DISCHARGES (CFS)			
	SQ MILES	10-YEAR	50-YEAR	100-YEAR	500-YEAR
DOE CREEK					
At County Line Road	5.2	1,400	1,960	2,200	2,760
At U.S. Route 52	4.4	1,280	1,770	1,980	2,500
At County Road 300 South	3.7	1,180	1,660	1,850	2,340
About 3,400 feet upstream of County Road 300 South	2.8	1,020	1,420	1,610	2,030
At County Road 600 West	2.4	940	1,320	1,490	1,890
BRIER CREEK					
At County Line Road	5.2	1,400	1,950	2,200	2,750
At County Road 200 South	4.7	1,310	1,840	2,080	2,600
At County Road 700 West	4.2	1,250	1,750	1,970	2,480
LITTLE SUGAR CREEK					
Mouth at Sugar Creek	31.8	4,700	6,900	8,150	11,000
Just upstream of confluence of Mulliner Ditch	30.0	4,600	6,600	7,800	10,500
Just upstream of confluence of Thompson Ditch	25.9	4,200	6,100	7,200	9,800
At U.S. Route 52	18.1	3,350	4,900	5,800	7,800
Just upstream of confluence of Maxwell Ditch	12.5	2,650	3,850	4,600	6,200
At County Road 300 South	7.0	1,840	2,700	3,150	4,350
At County Road 200 South	5.3	1,550	2,250	2,680	3,670
SIX MILE CREEK					
Mouth at Big Blue River	45.6	4,200	5,900	6,600	8,600
At County Road 800 North	44.0	4,100	5,800	6,500	8,400
Just downstream of County Road 900 North	41.1	3,950	5,550	6,250	8,100
Just upstream of confluence of Dilly Creek	32.8	3,500	5,000	5,600	7,200

Channel roughness factors (Manning's "n"), used in the hydraulic computations, were chosen by engineering judgment and based on field observations of the streams and flood plain areas. Values listed in Roughness Characteristics of Natural Channels, Guide for Selecting Roughness Coefficient "n" Values for Channels, and Open Channel Hydraulics were used as guides in choosing the roughness factors (References 9, 10 and 11).

For the Big Blue River, Sugar Creek and Buck Creek, roughness values for the main channel range from 0.030 to 0.060. For the main channels of Doe Creek, Brier Creek and Little Sugar Creek, the roughness factors range between 0.030 and 0.080, while for Six Mile Creek, the values are between 0.030 and 0.070. Flood plain roughness values range from 0.030 to 0.100 for all streams except the Big Blue River, in which the values range between 0.050 and 0.120 and, Six Mile Creek, in which values range from 0.040 to 0.075.

Starting water-surface elevations for the Big Blue River, Sugar Creek and Little Sugar Creek were obtained from the concurrent downstream study for the County of Shelby (Reference 12). The starting water-surface elevation for Buck Creek was obtained from the County of Marion, Indiana Flood Insurance Study (Reference 6). Doe Creek, Brier Creek and Six Mile Creek starting water-surface elevations were derived using the slope-area method. Water-surface elevations of floods of the selected recurrence intervals were computed through use of the COE HEC-2 step-backwater computer program (Reference 13).

Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals.

The hydraulic analyses for this study are based only on the effects of unobstructed flow. The flood elevations as shown on the profiles are, therefore, considered valid only if hydraulic structures, in general, remain unobstructed and if channel and overbank conditions remain essentially the same as ascertained during this study.

Flood boundaries for those streams studied by approximate methods were determined based on a regional drainage area versus flood stage analysis.

All elevations are referenced from National Geodetic Vertical Datum of 1929 (NGVD); elevation reference marks used in the study are shown on the maps.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by FEMA as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100-year and the 500-year floods have been delineated using the elevations determined at each cross section; between cross sections the boundaries were interpolated using topographic maps at a scale of 1:4800 with a contour interval of two feet (Reference 14). The flood boundaries for those streams studied by approximate methods were also delineated on the topographic maps (Reference 14).

For portions of Brandywine Creek, Willow Branch, Sweet Creek, West Little Sugar Creek, Prairie Branch and the Big Blue River studied by approximate methods, the boundary of the 100-year flood was developed from the Flood Hazard Boundary Map (Reference 15).

The boundaries of the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map. Small areas within the flood boundaries may lie above the flood elevations and, therefore, not be subject to flooding; owing to lack of detailed topographical information or to limitations of the map scale, such areas are not shown. In cases where the 100-year and the 500-year flood boundaries are close together, only the 100-year boundary has been shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood may be carried without substantial increases in flood heights. Minimum standards of FEMA limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced. The State of Indiana, however, as set down by the Indiana Flood Control Act of 1945 and the Natural Resources Commission Policy Guidelines, Section 6, adopted March 28, 1974 (Reference 16), has designated that encroachment in the flood plain is limited to that which will cause no significant increase in flood height. As a result, no more than 0.1-foot surcharge has been delineated for this study. The floodways shown in this report were approved by the Indiana State Natural Resources Commission when the review process was completed.

The floodways for this study were computed as all areas of effective flow conveyance. The results of these computations were tabulated at selected cross sections for each stream segment for which a floodway was computed

(Table 3). A second step, however, involved the delineation of "Administrative Floodways" as established by the IDNR. Briefly, the Water Resources Commission, acting through the IDNR, stipulates that any levee, bridge, road, or railroad track embankment or structure that significantly penetrates into the 100-year flood boundary is to be included in the floodway. This allows the Commission to maintain control and authority over land areas that would normally fall within the floodway if they had not been built. Also, the maintenance of these types of structures is facilitated by keeping them under Commission jurisdiction.

As shown on the Flood Boundary and Floodway Map, the floodway boundaries were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the boundaries of the floodway and the 100-year flood are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 0.1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 2.

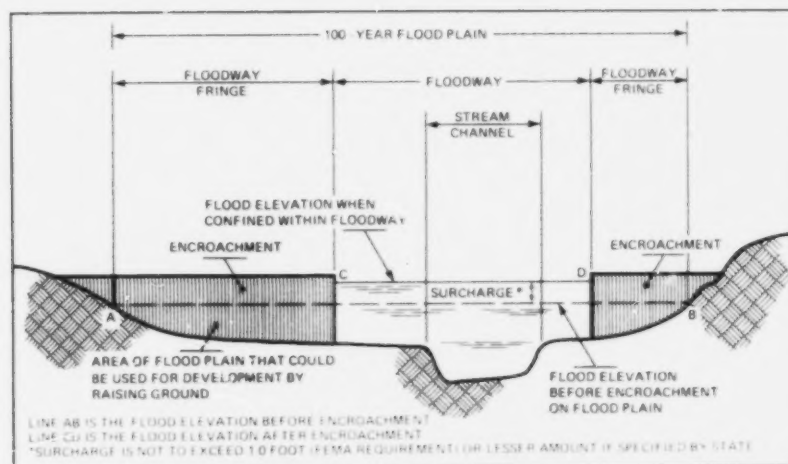


FIGURE 2 - Floodway Schematic

The floodways in this report are recommended to local agencies as minimum standards that can be adopted or that can be used as a basis for additional studies.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE
BIG BLUE RIVER							
A	41.23	1614	8839	1.8	832.5	832.5	0.0
B	41.88	1993	8531	1.9	835.6	835.6	0.0
C	42.19	2572	8669	1.8	836.5	836.5	0.0
D	42.50	3114	12,069	1.3	837.5	837.5	0.0
E	42.76	3052	7161	2.2	838.3	838.3	0.0
F	43.45	2056	5042	3.0	841.0	841.0	0.0
G	43.67	1820	6622	2.3	842.0	842.0	0.0
H	44.15	1158	4957	3.0	843.8	843.8	0.0
I	44.74	1238	7100	1.9	846.4	846.4	0.0
J	45.11	1356	7016	1.9	848.2	848.2	0.0
K	45.30	1451	6344	2.1	849.1	849.1	0.0
L	45.62	1150	5309	2.5	850.1	850.1	0.0
SIX MILE CREEK							
A	2539 ²	787	2964	2.2	847.2	847.2	0.0
B	5359 ²	856	2385	2.8	851.0	851.0	0.0
C	6759 ²	1,479	4223	1.6	852.7	852.7	0.0
D	17,328 ²	764	2383	2.7	869.2	869.2	0.0
E	19,173 ²	883	2296	2.8	871.4	871.4	0.0
F	23,043 ²	500	1694	3.3	879.0	879.0	0.0

¹MILES ABOVE MOUTH

²FEET ABOVE MOUTH

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

FLOODWAY DATA

BIG BLUE RIVER - SIX MILE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE
SUGAR CREEK							
A	36.07	967	5768	2.2	795.2	795.2	0.0
B	36.34	1454	6875	1.8	795.5	795.5	0.0
C	36.50	875	3964	3.2	795.7	795.7	0.0
D	36.79	534	2547	4.9	796.9	796.9	0.0
E	37.06	419	3150	4.0	798.4	798.4	0.0
F	37.21	698	3286	3.8	799.2	799.2	0.0
G	37.45	426	2922	4.3	801.6	801.6	0.0
H	37.58	685/600 ²	4940	2.5	802.2	802.2	0.0
I	37.98	712	6464	1.9	805.5	805.5	0.0
J	38.49	565	4459	2.8	806.8	806.8	0.0
K	38.84	749	7044	1.7	807.2	807.2	0.0
L	39.16	819	7081	1.7	807.4	807.4	0.0
M	39.46	1035	5886	2.1	807.5	807.5	0.0
N	39.63	477	2769	4.4	808.4	808.4	0.0
O	39.86	492	4368	2.8	812.7	812.7	0.0
P	40.14	542	4887	2.5	813.7	813.7	0.0
Q	40.31	522	4738	2.6	814.1	814.1	0.0
R	40.47	603	5592	2.2	814.8	814.8	0.0
S	40.75	830	3076	4.0	815.7	815.7	0.0
T	41.12	563	4138	3.0	819.1	819.1	0.0
U	41.37	798	6282	2.0	819.5	819.5	0.0
V	41.79	763	4880	2.5	819.8	819.8	0.0
W	42.06	740	5119	2.4	820.2	820.2	0.0
X	42.46	758	3466	3.5	821.7	821.7	0.0
Y	43.04	596	5615	2.1	827.2	827.2	0.0
Z	43.32	1087	9511	1.2	827.4	827.4	0.0

¹MILES ABOVE MOUTH

²TOTAL WIDTH/WIDTH WITHIN UNINCORPORATED AREA

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

FLOODWAY DATA

SUGAR CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE
SUGAR CREEK							
AA	43.78	760	5375	2.2	828.0	828.0	0.0
AB	44.26	919	6326	1.9	829.6	829.6	0.0
AC	44.43	1295	8326	1.4	830.0	830.0	0.0
AD	44.72	770	3979	3.0	830.5	830.5	0.0
AE	44.91	606	3391	3.5	831.6	831.6	0.0
AF	45.64	894/740 ²	5723	2.1	836.5	836.5	0.0
AG	45.87	819	4835	2.4	838.0	838.0	0.0
AH	46.03	534	3621	3.3	839.9	839.9	0.0
AI	46.19	670	3451	3.4	841.1	841.1	0.0
AJ	46.49	812	5296	2.1	842.8	842.8	0.0
AK	46.78	1180	2727	4.0	843.0	843.0	0.0
AL	47.51	782	3902	2.8	844.6	844.6	0.0
AM	47.71	1011	6256	1.8	845.2	845.2	0.0
AN	47.98	1517	7563	1.5	845.3	845.3	0.0
AO	48.33	892	2981	3.7	845.7	845.7	0.0
AP	48.57	699	3137	3.5	847.5	847.5	0.0
AQ	48.88	1216	5559	2.0	850.6	850.6	0.0
AR	49.23	1065	3488	3.2	851.2	851.2	0.0
AS	49.66	981	7371	1.5	855.3	855.3	0.0
AT	49.85	1005	5576	2.0	855.7	855.7	0.0
AU	50.45	1188	6187	1.6	856.3	856.3	0.0
AV	50.72	1463	5000	2.0	856.5	856.5	0.0
AW	50.92	1269	2962	3.4	856.9	856.9	0.0
AX	51.53	745	3073	3.3	860.3	860.3	0.0
AY	51.90	339	2435	4.1	861.7	861.7	0.0
AZ	52.17	412	3344	3.0	864.0	864.0	0.0

¹MILES ABOVE MOUTH

²TOTAL WIDTH / WIDTH WITHIN UNINCORPORATED AREAS

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

FLOODWAY DATA

SUGAR CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE
SUGAR CREEK							
BA	52.47	467	3368	3.0	865.3	865.3	0.0
BB	52.81	681	5343	1.9	865.7	865.7	0.0
BC	53.06	511	4354	2.3	866.0	866.0	0.0
BD	53.19	670	4703	2.1	866.6	866.6	0.0
BE	53.35	1056	7164	1.4	867.1	867.1	0.0
BF	53.71	803	4010	2.5	869.5	869.5	0.0
BG	54.03	1130	6942	1.5	870.2	870.2	0.0
BH	54.24	951	7500	1.3	870.6	870.6	0.0
BI	54.40	780	10,456	1.0	870.9	870.9	0.0

¹MILES ABOVE MOUTH

TABLE 3	FEDERAL EMERGENCY MANAGEMENT AGENCY	FLOODWAY DATA
	COUNTY OF HANCOCK, IN (UNINCORPORATED AREAS)	SUGAR CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE
LITTLE SUGAR CREEK							
A	14,522	660	4555	1.7	807.1	807.1	0.0
B	14,992	520	3217	2.3	807.2	807.2	0.0
C	15,542	639	3414	2.2	807.3	807.3	0.0
D	16,542	915	3631	2.1	808.2	808.2	0.0
E	17,922	472	1974	3.8	808.8	808.8	0.0
F	19,742	421	1471	4.0	810.7	810.7	0.0
G	21,357	746	1988	3.0	813.9	813.9	0.0
H	22,837	696	1910	3.1	815.7	815.7	0.0
I	23,922	668	1943	3.0	816.8	816.8	0.0
J	25,172	337	1170	4.6	817.7	817.7	0.0
K	28,319	452	3139	1.7	826.2	826.2	0.0
L	29,369	731	3874	1.4	826.7	826.7	0.0
M	32,549	593	2577	2.1	828.8	828.8	0.0
N	33,409	721	2529	2.1	829.6	829.6	0.0
O	34,261	634	2178	2.5	830.7	830.7	0.0
P	34,981	506	1433	3.1	831.4	831.4	0.0
Q	36,211	786	2671	1.7	833.3	833.3	0.0
R	38,051	781	1724	2.6	834.0	834.0	0.0
S	39,755	469	1207	3.7	836.4	836.4	0.0
T	41,075	519	1632	2.8	837.7	837.7	0.0
U	43,035	399	1002	4.5	838.6	838.6	0.0
V	44,485	663	2140	2.1	840.1	840.1	0.0
W	46,380	1042	3823	1.0	842.9	842.9	0.0
X	47,830	1010	3025	1.3	843.1	843.1	0.0
Y	49,470	825	1670	2.3	843.6	843.6	0.0
Z	50,800	422	929	4.1	845.5	845.5	0.0

¹ FEET ABOVE CONFLUENCE WITH SUGAR CREEK

TABLE 3	FEDERAL EMERGENCY MANAGEMENT AGENCY	FLOODWAY DATA
	COUNTY OF HANCOCK, IN (UNINCORPORATED AREAS)	LITTLE SUGAR CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE
BUCK CREEK							
A	1842	530	4548	1.7	834.3	834.3	0.0
B	3327	655	6143	1.2	835.1	835.1	0.0
C	4857	865/700 ²	6292	1.2	835.2	835.2	0.0
D	6087	782/550 ²	4381	1.7	835.3	835.3	0.0
E	8157	652	3736	2.0	835.6	835.6	0.0
F	9407	808	3772	2.0	835.9	835.9	0.0
G	14,827	686	3229	2.2	840.5	840.5	0.0
H	16,617	795	3112	2.3	841.3	841.3	0.0
I	18,537	602	2438	2.9	842.4	842.4	0.0
J	19,877	646	2540	2.8	843.1	843.1	0.0
K	22,391	800	3124	2.2	844.9	844.9	0.0
L	24,208	644	2655	2.6	845.6	845.6	0.0
M	26,682	662	3424	2.0	848.2	848.2	0.0
N	27,592	716	3562	1.9	848.4	848.4	0.0
O	30,502	1190	5650	1.1	849.3	849.3	0.0
P	32,297	778	2596	2.4	849.6	849.6	0.0
Q	33,137	710	1561	3.7	849.9	849.9	0.0
R	34,796	837	5587	1.0	853.7	853.7	0.0
S	36,016	624	4711	1.2	853.7	853.7	0.0
T	36,793	651	3582	1.6	853.9	853.9	0.0
U	37,633	1269	5884	1.0	854.0	854.0	0.0
V	39,193	1576	5569	1.0	854.0	854.0	0.0
W	40,828	2445	7219	.8	854.1	854.1	0.0
X	43,469	2710	10,853	.4	854.2	854.2	0.0
Y	44,959	2094	6915	.7	854.2	854.2	0.0
Z	46,374	1634	6260	.7	854.2	854.2	0.0

¹FEET ABOVE COUNTY LINE ROAD

²TOTAL WIDTH/WIDTH WITHIN UNINCORPORATED AREA

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

FLOODWAY DATA

BUCK CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE
BUCK CREEK							
AA	47,607	1349	5312	.9	854.3	854.3	0.0
AB	49,622	1362	4470	.8	854.4	854.4	0.0
AC	51,312	1098	3509	1.1	854.5	854.5	0.0
AD	53,690	984	1844	2.0	855.1	855.1	0.0
AE	55,931	999	2180	1.3	856.7	856.7	0.0
AF	57,071	1070	2718	1.0	856.9	856.9	0.0
AG	58,491	891	2316	1.2	857.1	857.1	0.0
AH	59,267	875	2014	1.4	857.2	857.2	0.0
BRIER CREEK							
A	501	331	972	2.3	827.9	827.9	0.0
B	1151	305	1112	2.0	828.4	828.4	0.0
C	2016	169	402	5.5	829.5	829.5	0.0
D	2616	381	988	2.2	831.0	831.0	0.0
E	3536	183	365	6.0	832.0	832.0	0.0
F	4296	340	1039	2.1	834.1	834.1	0.0
G	6423	428	983	2.2	837.6	837.6	0.0
H	7163	289	546	4.0	838.9	838.9	0.0
I	8483	404	1034	2.0	841.9	841.9	0.0
J	9093	172	479	4.3	842.3	842.3	0.0
K	11,274	630	2015	1.0	845.5	845.5	0.0
L	12,908	535	1028	1.9	846.0	846.0	0.0

¹ FEET ABOVE COUNTY LINE ROAD

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

FLOODWAY DATA

BUCK CREEK - BRIER CREEK

BEST DOCUMENT AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE
DOE CREEK							
A	788	310	976	2.3	807.6	807.6	0.0
B	1548	329	618	3.6	808.6	808.6	0.0
C	3838	288	597	3.7	813.2	813.2	0.0
D	4818	320	1018	2.2	816.2	816.2	0.0
E	6118	274	845	2.6	819.3	819.3	0.0
F	7068	299	1170	1.9	822.1	822.1	0.0
G	8148	382	1208	1.8	824.2	824.2	0.0
H	8928	247	799	2.5	825.2	825.2	0.0
I	11,020	429	2512	0.8	833.8	833.8	0.0
J	13,289	810	2034	0.9	834.1	834.1	0.0
K	14,744	602	1462	1.3	834.2	834.2	0.0
L	16,157	464	719	2.6	836.2	836.2	0.0
M	17,448	298	619	2.6	838.0	838.0	0.0
N	18,548	298	659	2.4	839.3	839.3	0.0
O	19,798	373	883	1.8	840.2	840.2	0.0
P	20,658	457	917	1.6	840.7	840.7	0.0
Q	23,232	560	976	1.5	843.3	843.3	0.0
R	24,392	273	465	3.2	844.3	844.3	0.0

¹FEET ABOVE COUNTY LINE ROAD

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

FLOODWAY DATA

DOE CREEK

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, FEMA has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHF), and flood insurance zone designations for each flooding source affecting Hancock County.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 per cent of the reach.

<u>Average Difference Between 10- and 100-year Floods</u>	<u>Variation</u>
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The locations of the reaches determined for Hancock County are shown on the Flood Profiles and are summarized in Table 4, "Flood Insurance Zone Data."

5.2 Flood Hazard Factors

The FHF is used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHF's are used to set actuarial insurance premium rate tables based on FHF's from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest 0.5 foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHF's, the entire unincorporated areas of Hancock County were divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations are shown or FHF's determined.
Zones A1-A5, A7:	Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations are shown, and zones subdivided according to FHF.
Zone B:	Areas between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; or areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.
Zone C:	Areas of minimal flooding.

Table 4, "Flood Insurance Zone Data," summarizes the flood elevation differences, FHF's, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for Hancock County is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by FEMA.

6.0 OTHER STUDIES

A Flood Insurance Study is currently in progress for the City of Greenfield in Hancock County and for Shelby, Rush and Marion Counties, all of which border Hancock County (References 17, 12, 18 and 6). The results of these studies exactly match the Hancock County Study. No other studies were found to exist at the time of this report.

A Flood Hazard Boundary Map has been published for the community (Reference 15). The differences between the Flood Hazard Boundary Map and this study are justified due to the more detailed nature of this Flood Insurance Study.

FLOODING SOURCE	PANEL ¹	ELEVATION DIFFERENCE ² BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION ³ (NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
BIG BLUE RIVER							
REACH 1	0125,0150	-1.6	-0.5	0.6	015	A3	VARIES-SEE MAP
SIX MILE CREEK							
REACH 1	0150	-1.0	-0.3	0.7	010	A2	VARIES-SEE MAP
SUGAR CREEK							
REACH 1	0100,0125,0050	-2.3	-0.7	1.6	025	A5	VARIES-SEE MAP
LITTLE SUGAR CREEK							
REACH 1	0100	-2.0	-0.6	1.4	020	A4	VARIES-SEE MAP
REACH 2	0100,0125	-1.4	-0.5	1.0	015	A3	VARIES-SEE MAP
REACH 3	0125	-0.9	-0.3	0.6	010	A2	VARIES-SEE MAP
BUCK CREEK							
REACH 1	0100	-1.5	-0.5	1.2	015	A3	VARIES-SEE MAP
REACH 2	0100	-3.4	-1.2	3.3	035	A7	VARIES-SEE MAP
REACH 3	0025,0100	-1.3	-0.4	1.1	015	A3	VARIES-SEE MAP
REACH 4	0025	-2.3	-0.9	2.9	025	A5	VARIES-SEE MAP
REACH 5	0025	-0.7	-0.2	1.3	005	A1	VARIES-SEE MAP
BRIER CREEK							
REACH 1	0100	-0.7	-0.3	0.4	005	A1	VARIES-SEE MAP

¹FLOOD INSURANCE RATE MAP PANEL²WEIGHTED AVERAGE³ROUNDED TO NEAREST FOOT

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

BIG BLUE RIVER - SIX MILE CREEK - SUGAR CREEK -
LITTLE SUGAR CREEK - BUCK CREEK - BRIER CREEK

FLOODING SOURCE	PANEL ¹	ELEVATION DIFFERENCE ² BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION ³ (NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
DOE CREEK							
REACH 1	0100	-0.8	-0.2	0.5	010	A2	VARIES—SEE MAP
REACH 2	0100	-2.4	-0.4	0.3	025	A5	VARIES—SEE MAP
REACH 3	0100	-0.6	-0.2	0.3	005	A1	VARIES—SEE MAP

¹FLOOD INSURANCE RATE MAP PANEL

²WEIGHTED AVERAGE

³ROUNDED TO NEAREST FOOT

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

DOE CREEK

This report either supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the National Flood Insurance Program.

7.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, Federal Emergency Management Agency, 300 South Wacker Drive, (24th Floor), Chicago, Illinois 60606.

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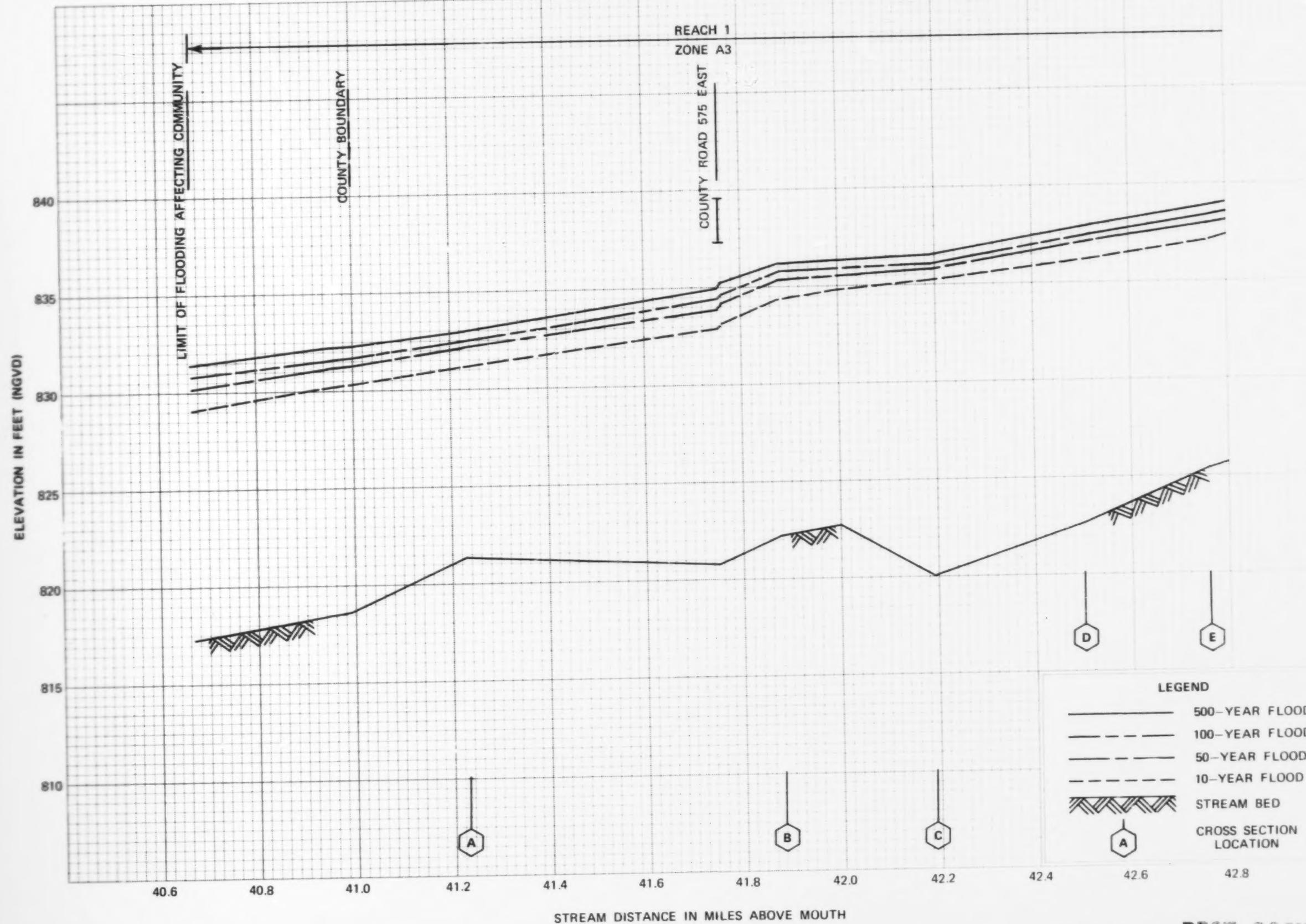
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_____, Statistical Summaries of Indiana Streamflow Data, Water Resources Investigations, 35-75, February 1976.

_____, Water Resources Data for Indiana Water Year 1977, 1978.

_____, Summary of Floods in the United States in 1956, Water Supply Paper 1530, 1964.

U.S. Weather Bureau, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, May 1961.



FLOOD PROFILES

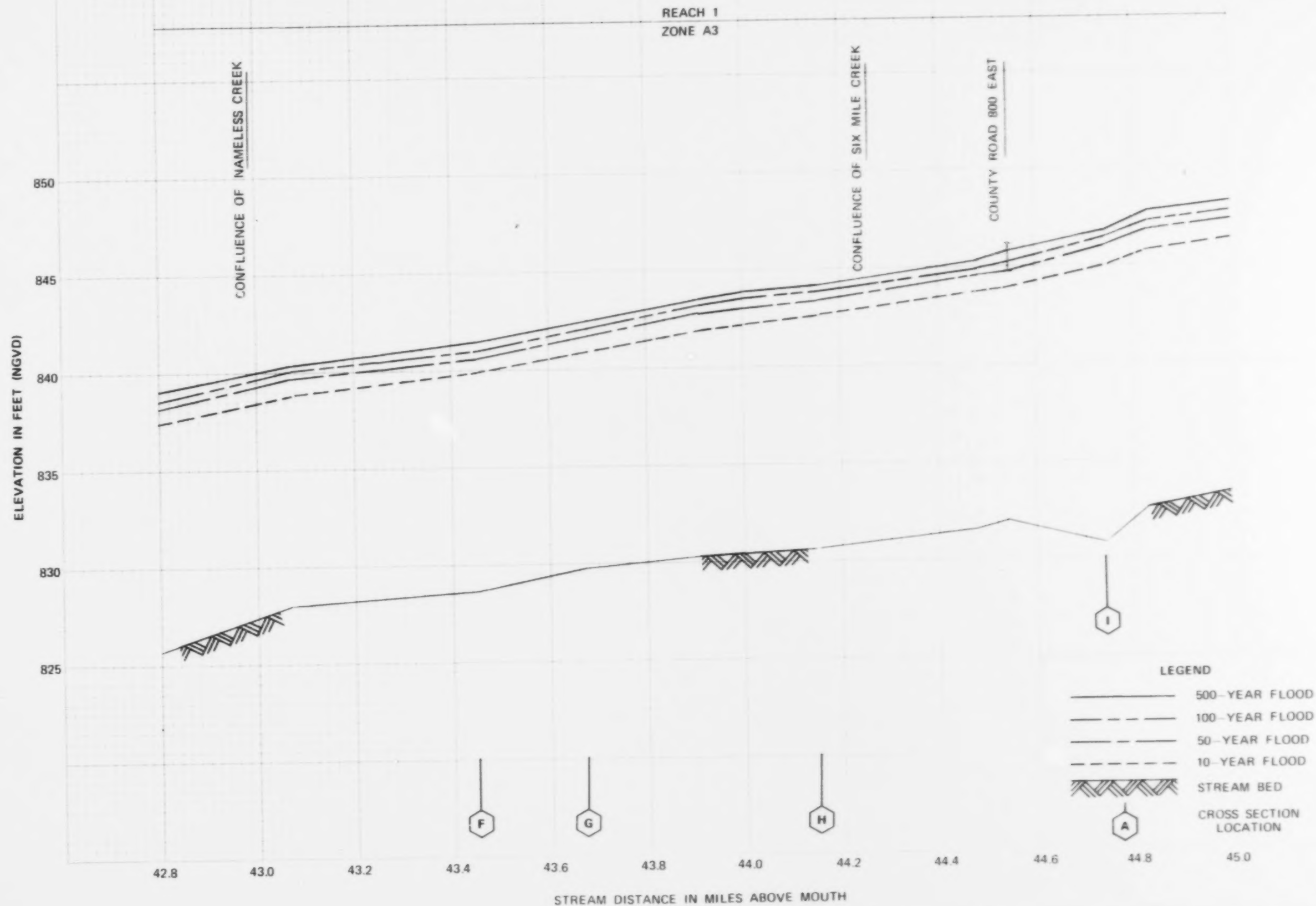
BIG BLUE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

01P

BEST DOCUMENT AVAILABLE



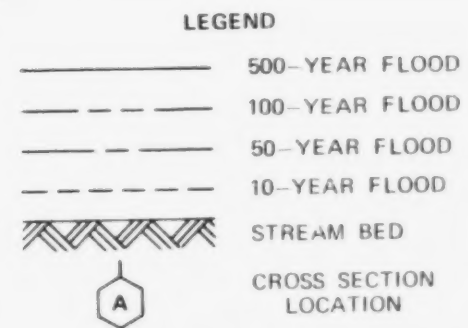
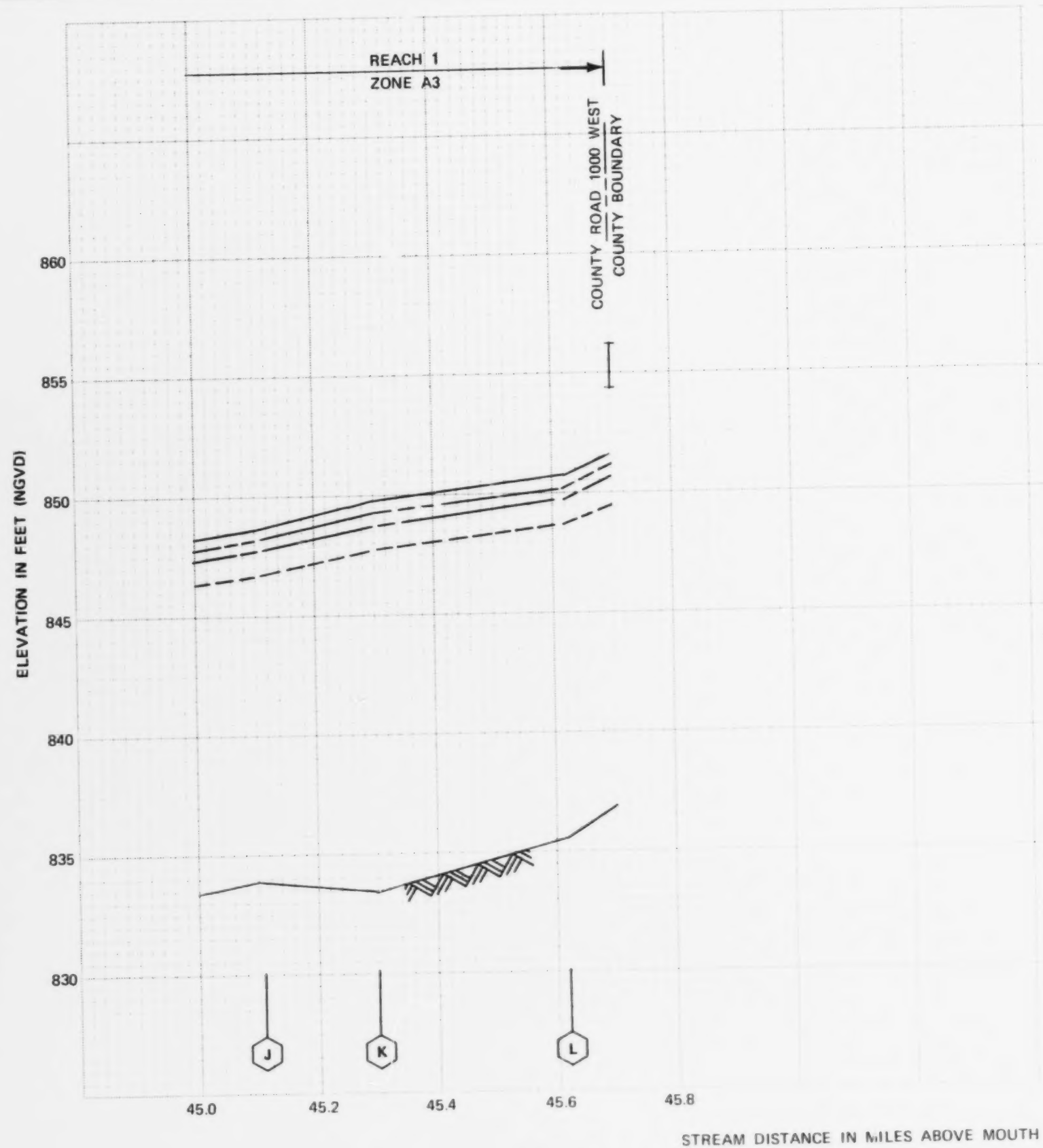
FLOOD PROFILES

BIG BLUE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

02P



FLOOD PROFILES

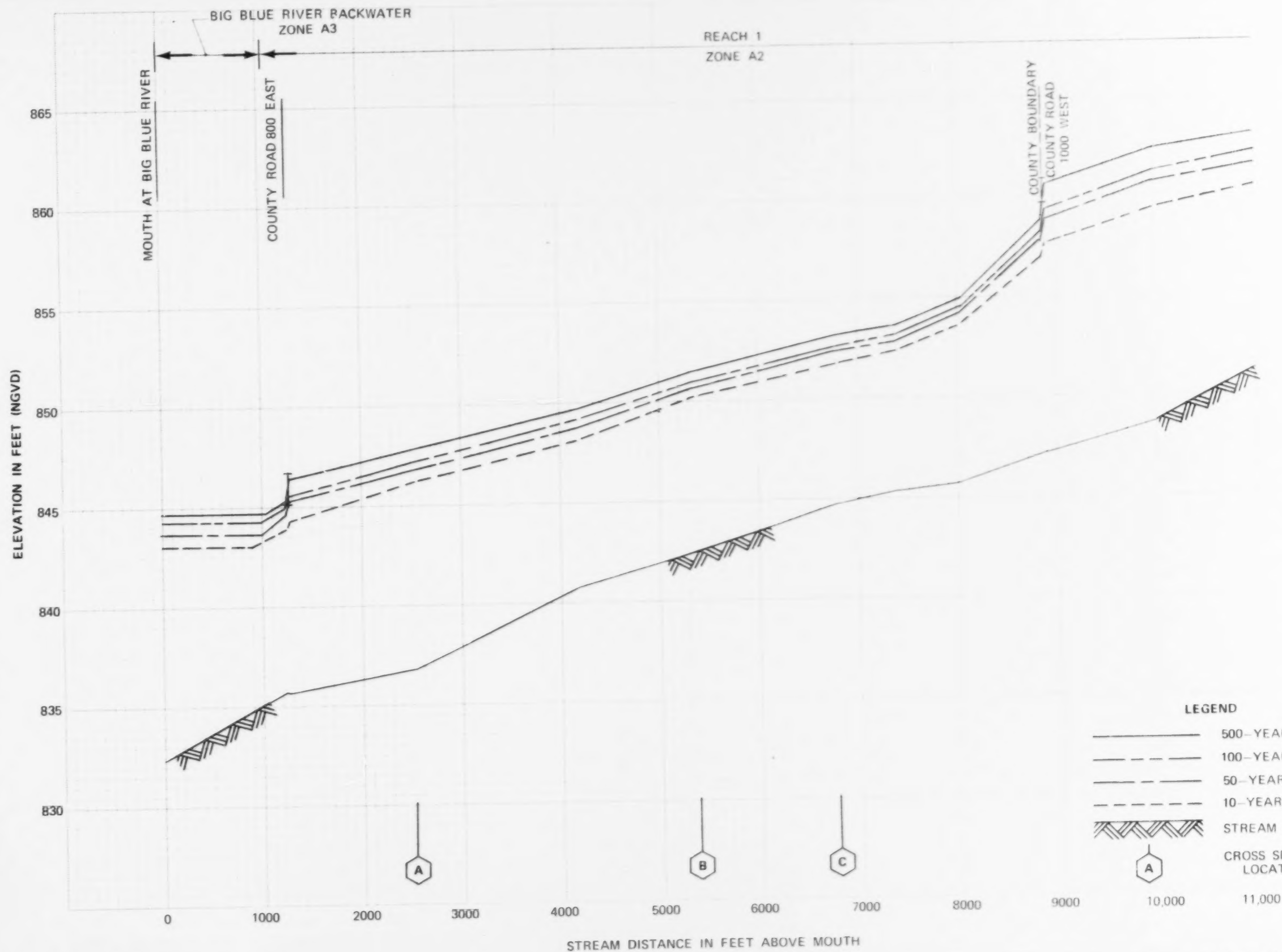
BIG BLUE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

03P

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- LEGEND**
- 500-YEAR FLOOD
 - 100-YEAR FLOOD
 - 50-YEAR FLOOD
 - 10-YEAR FLOOD
 - ////// STREAM BED
 - ⬡ CROSS SECTION LOCATION

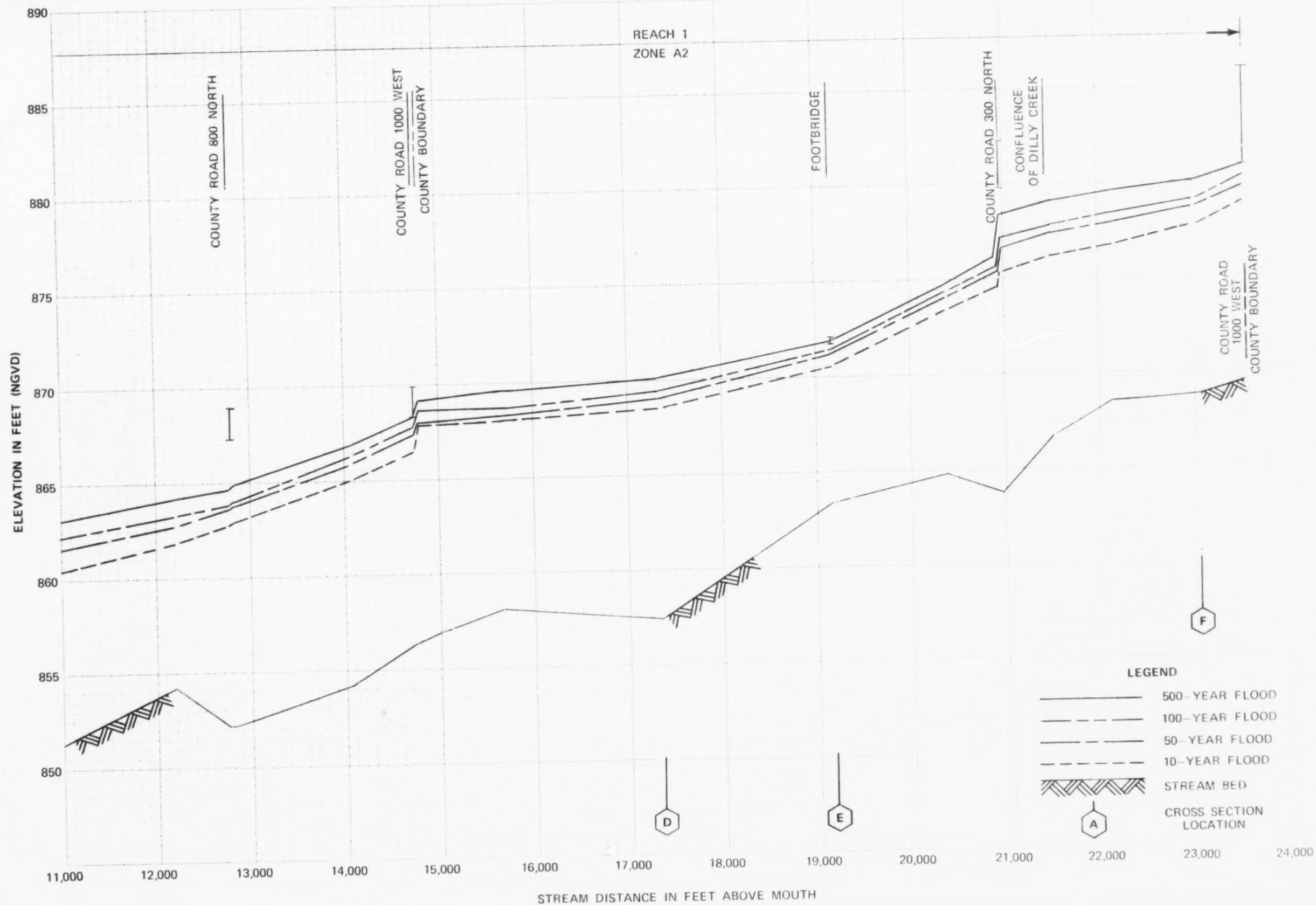
FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

FLOOD PROFILES

SIX MILE CREEK

BEST DOCUMENT AVAILABLE



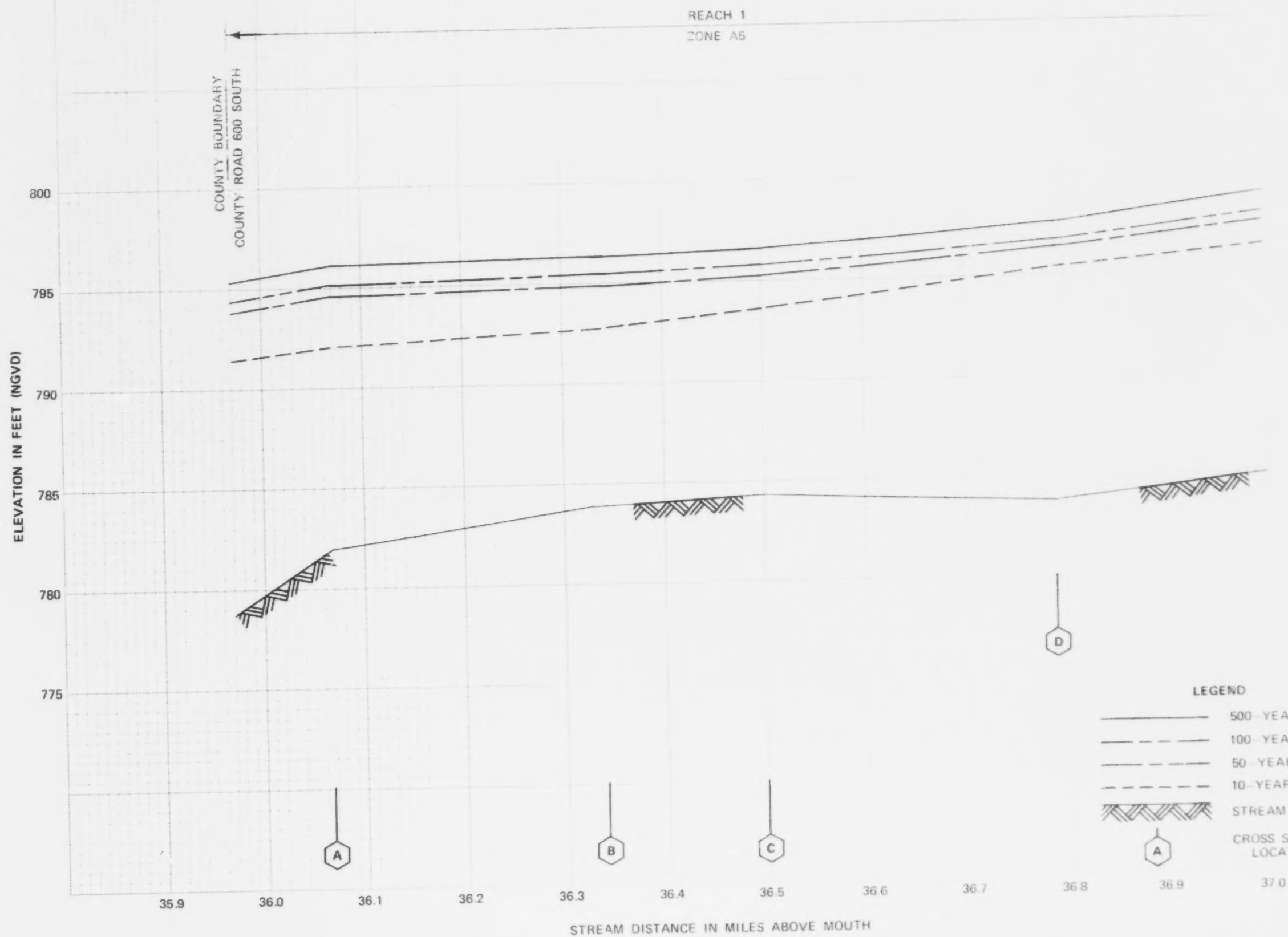
FLOOD PROFILES

SIX MILE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

05P



FLOOD PROFILES

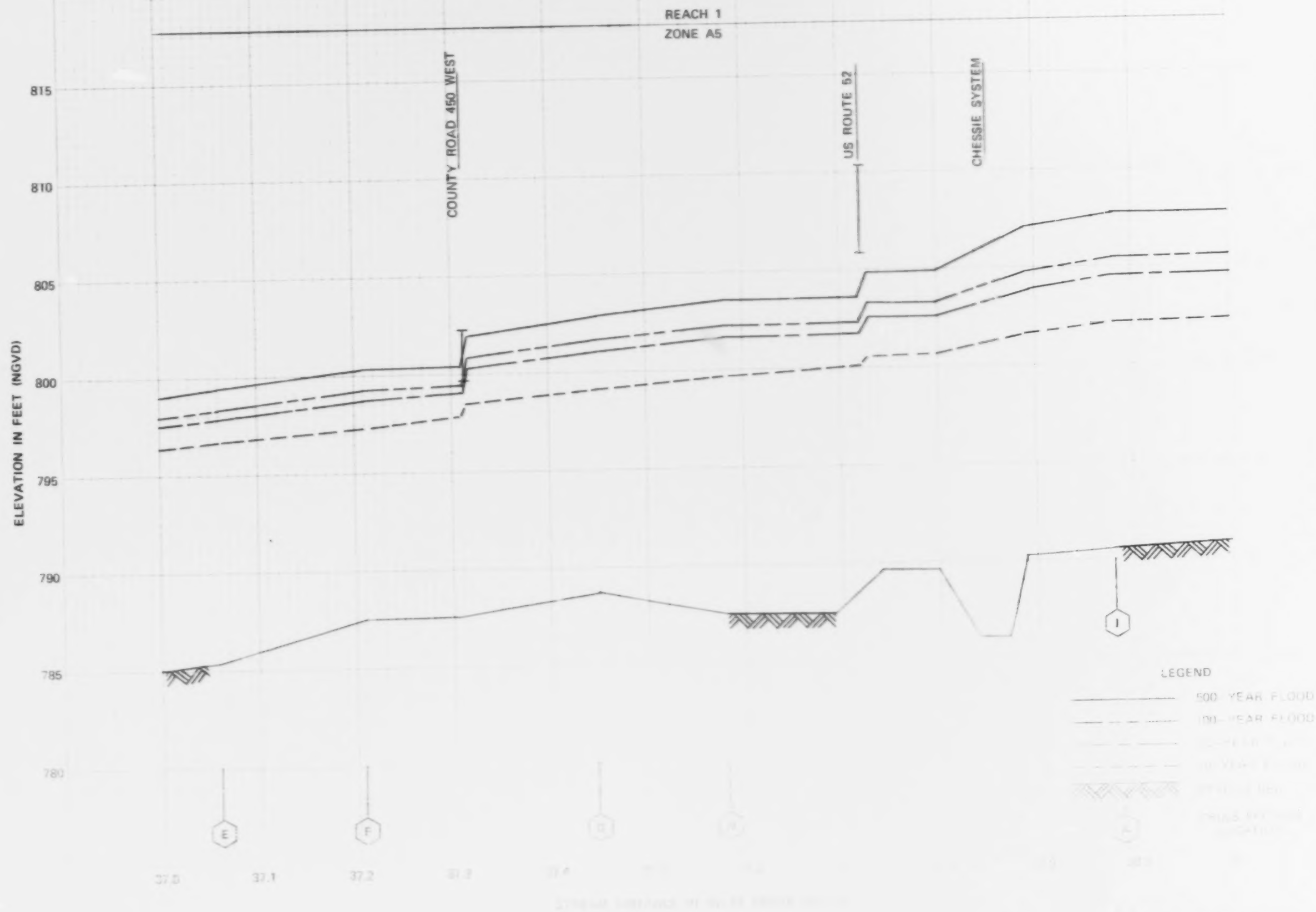
SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

06P

BEST DOCUMENT AVAILABLE



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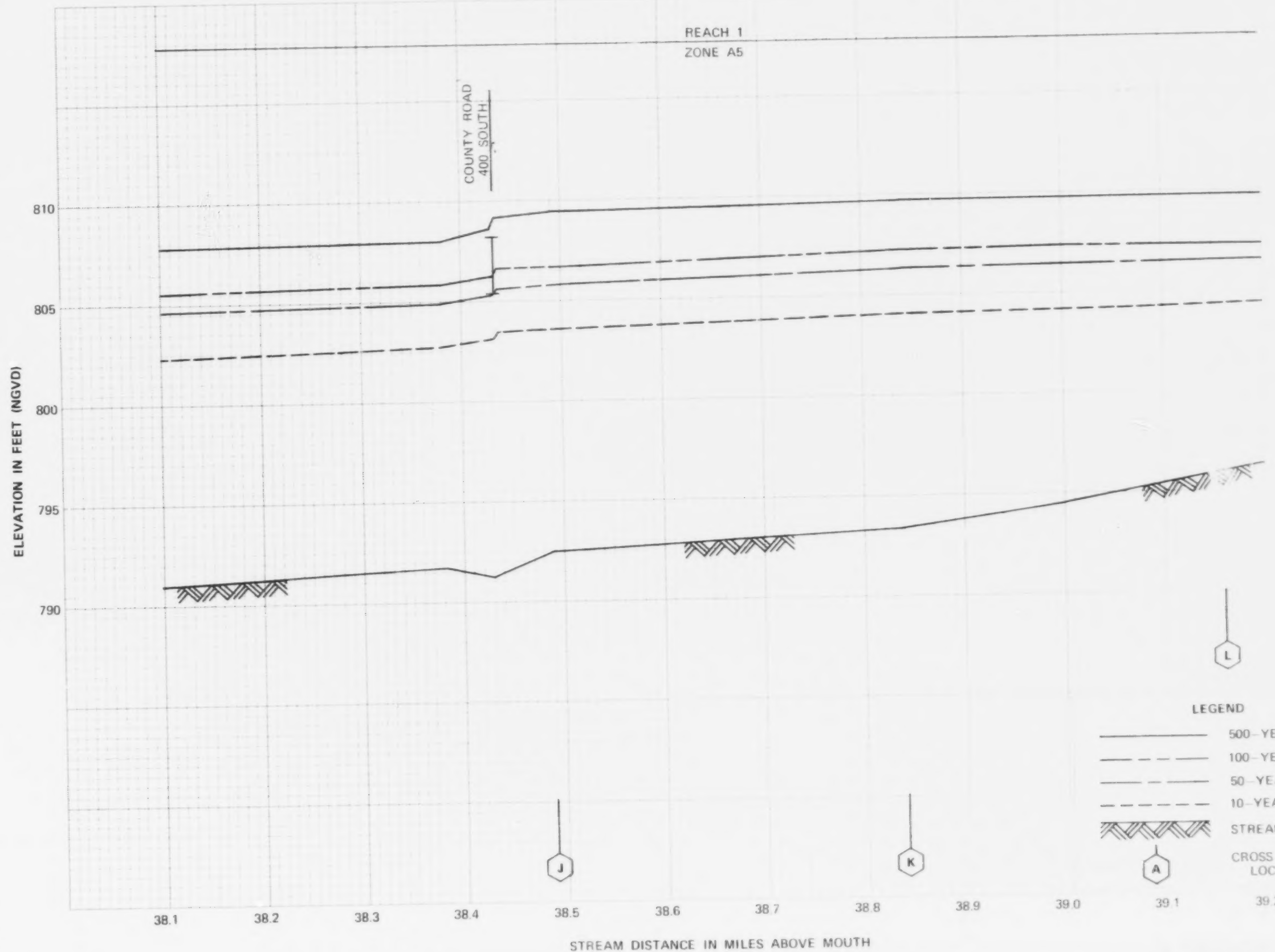
SUGAR CREEK

LOCAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

077

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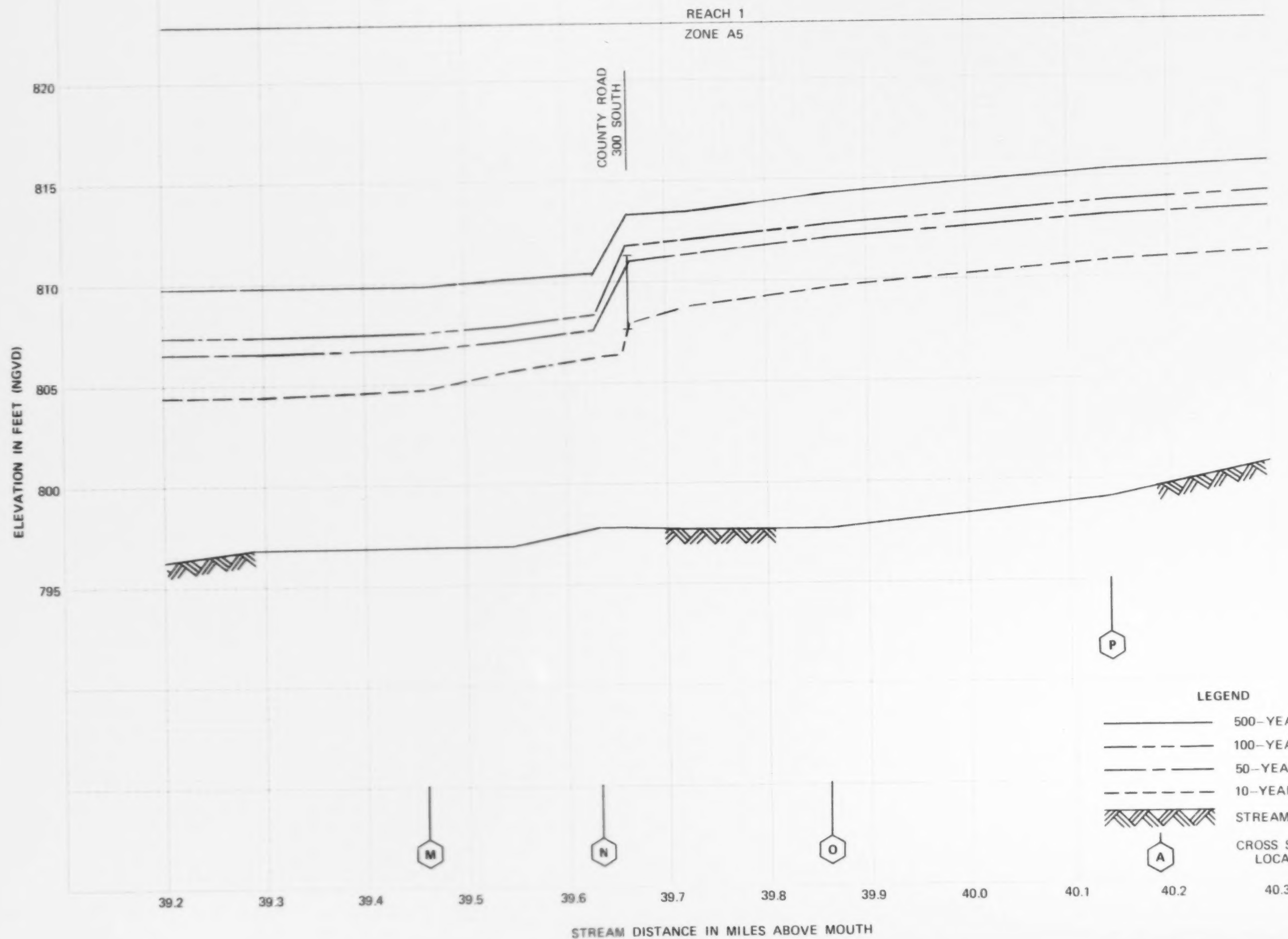
SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

08P

BEST DOCUMENT AVAILABLE



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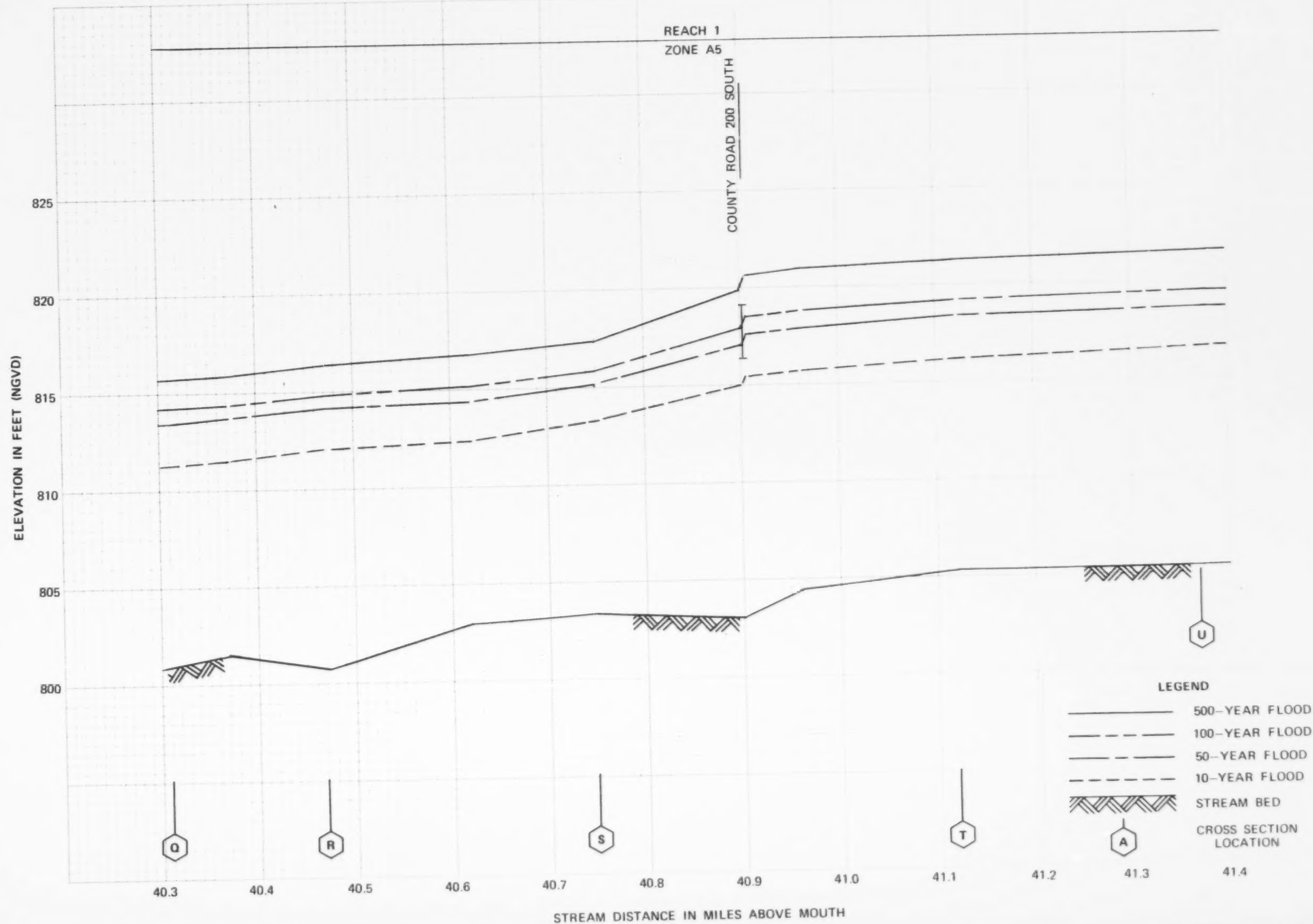
SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

09P

BEST DOCUMENT AVAILABLE



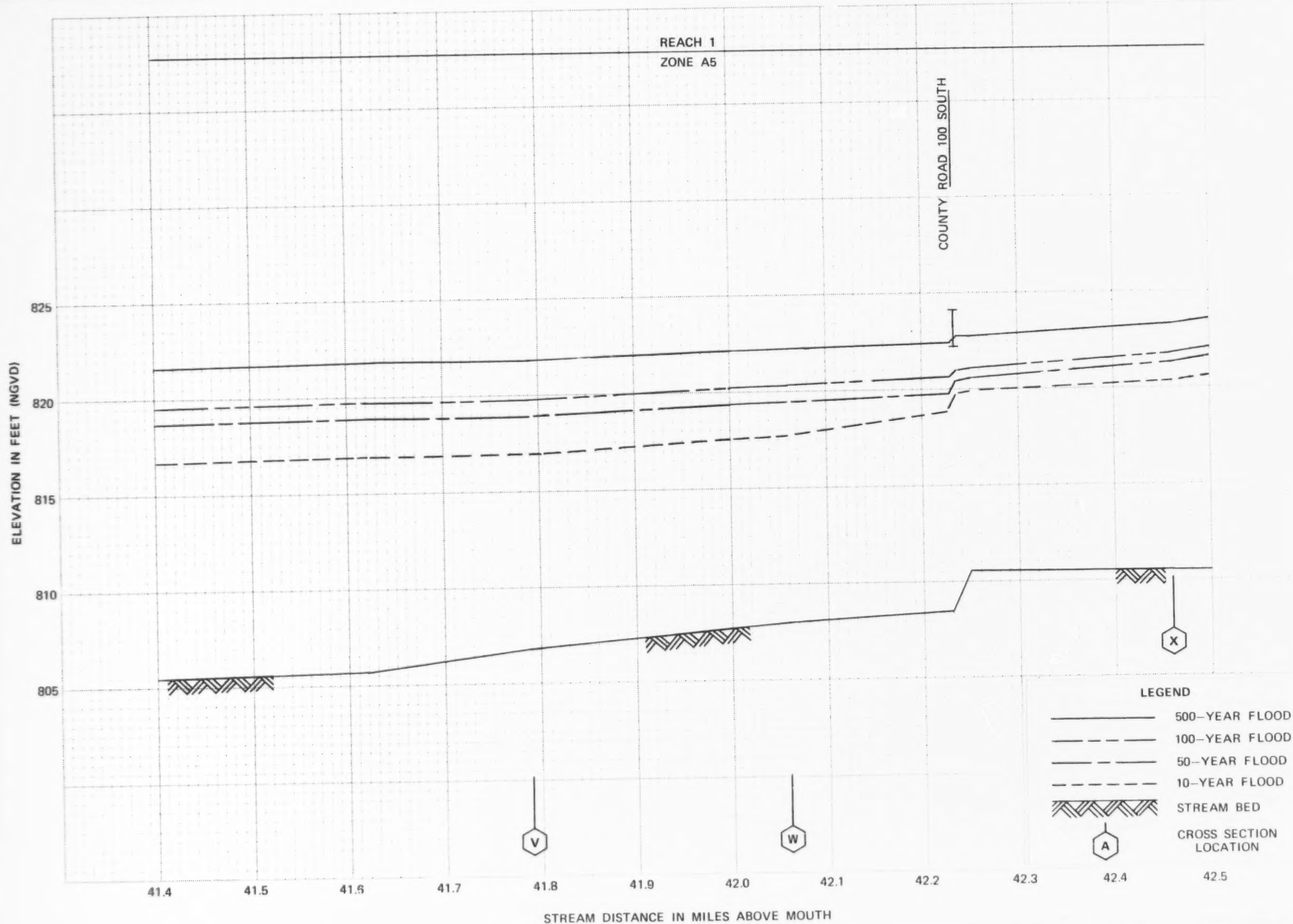
FLOOD PROFILES

SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

10P



FLOOD PROFILES

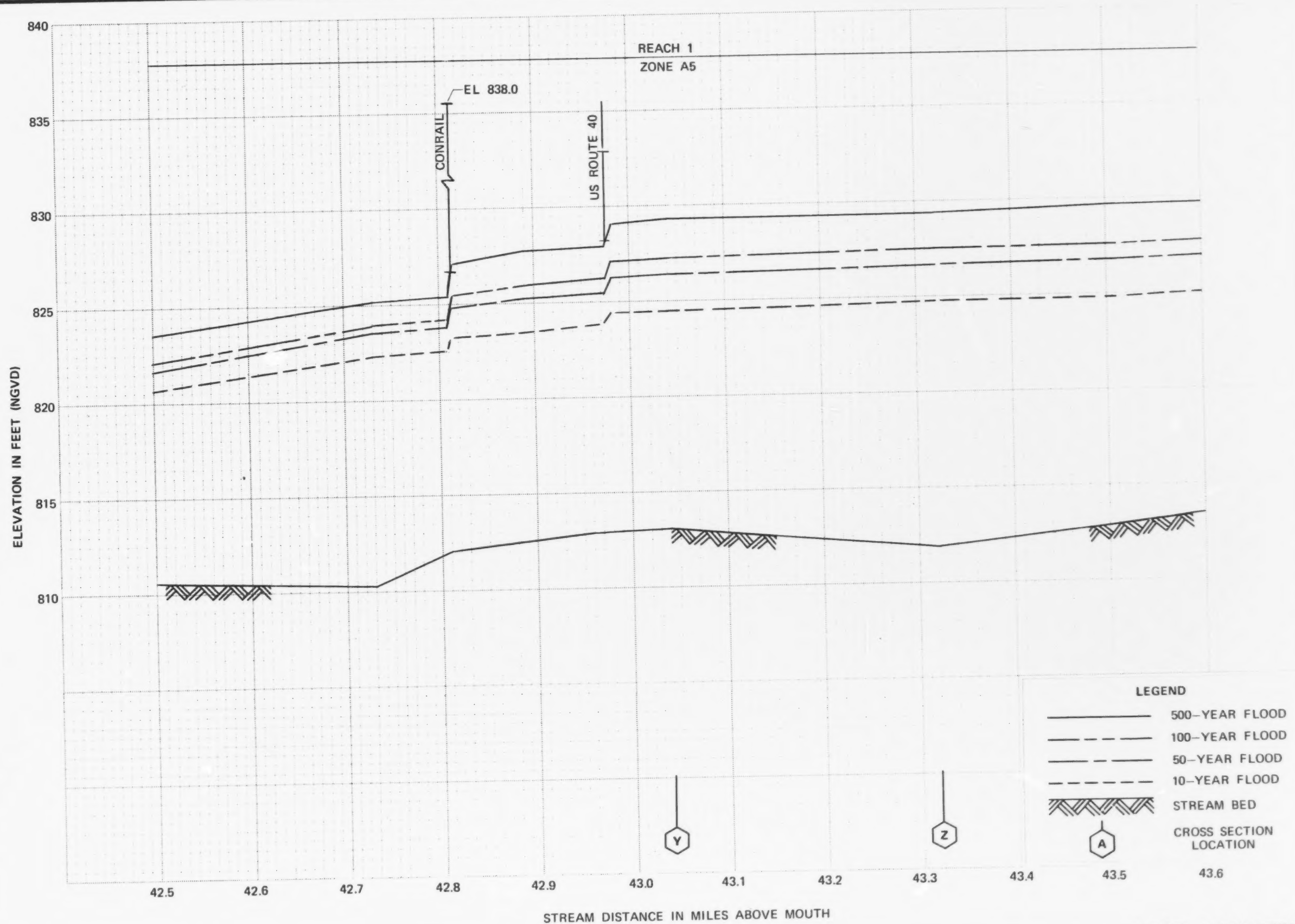
SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

11P

BEST DOCUMENT AVAILABLE



FLOOD PROFILES

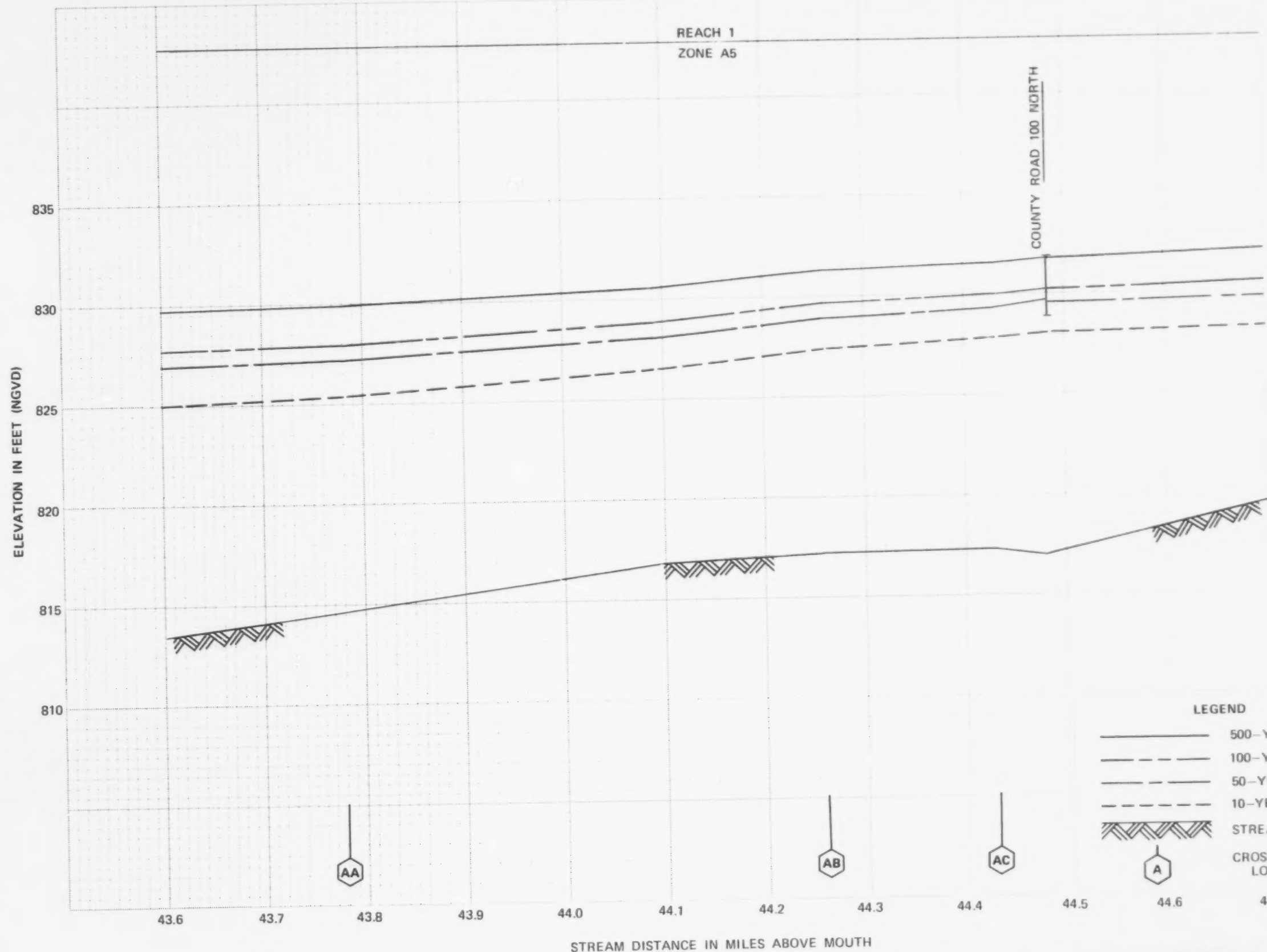
SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

12P

BEST DOCUMENT AVAILABLE



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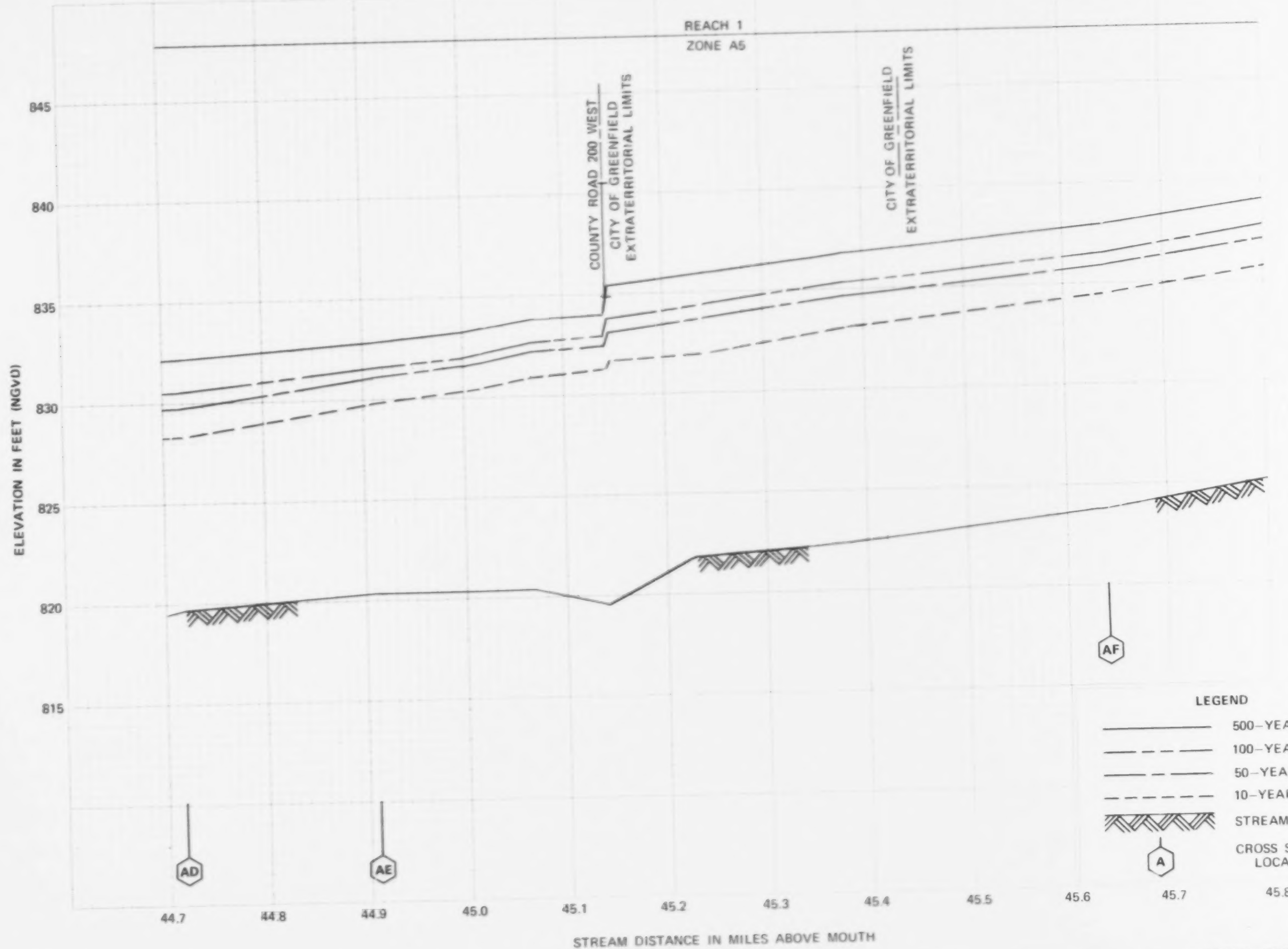
SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

13P

BEST DOCUMENT AVAILABLE



FLOOD PROFILES

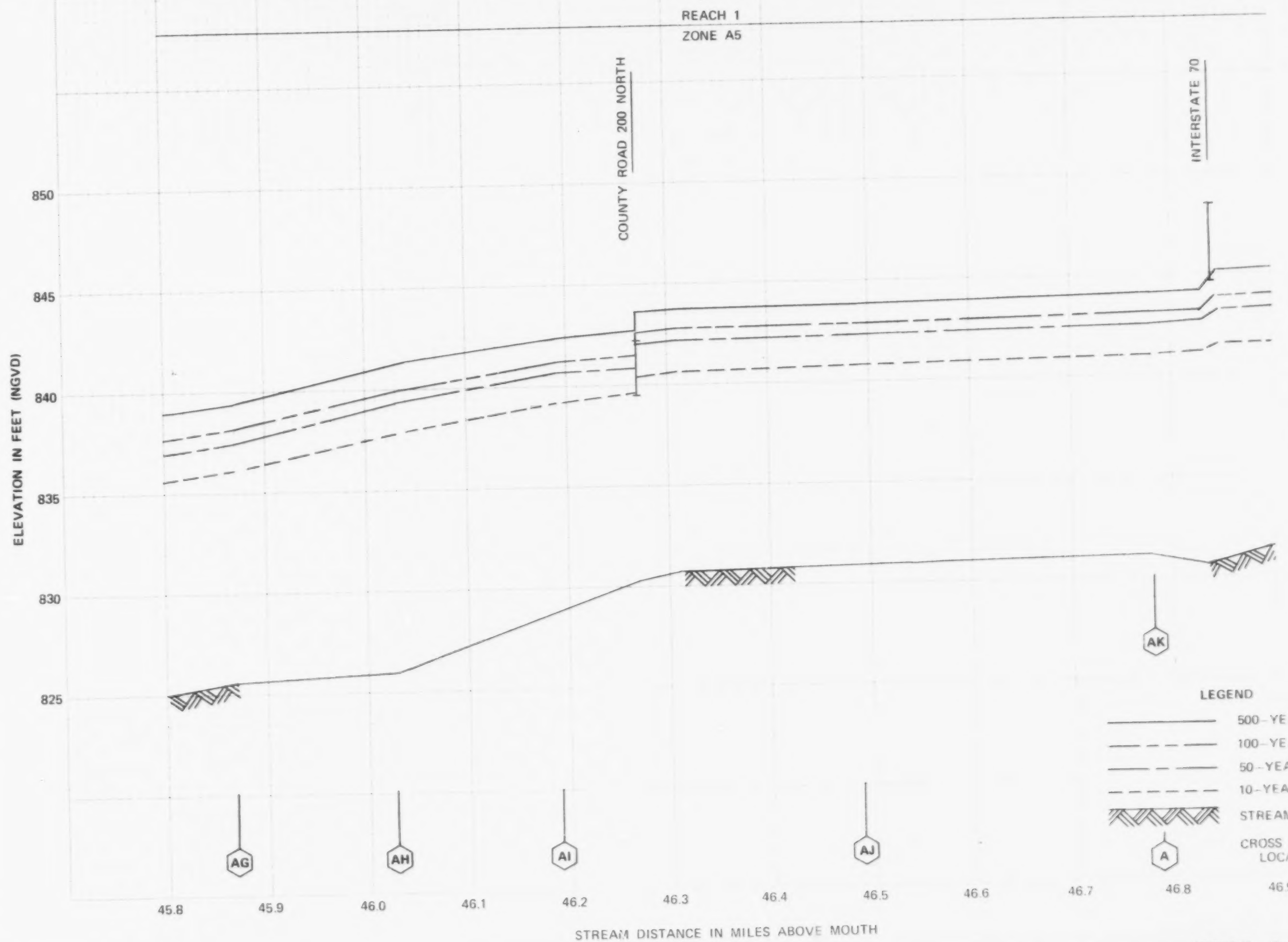
SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

14P

BEST DOCUMENT AVAILABLE



FLOOD PROFILES

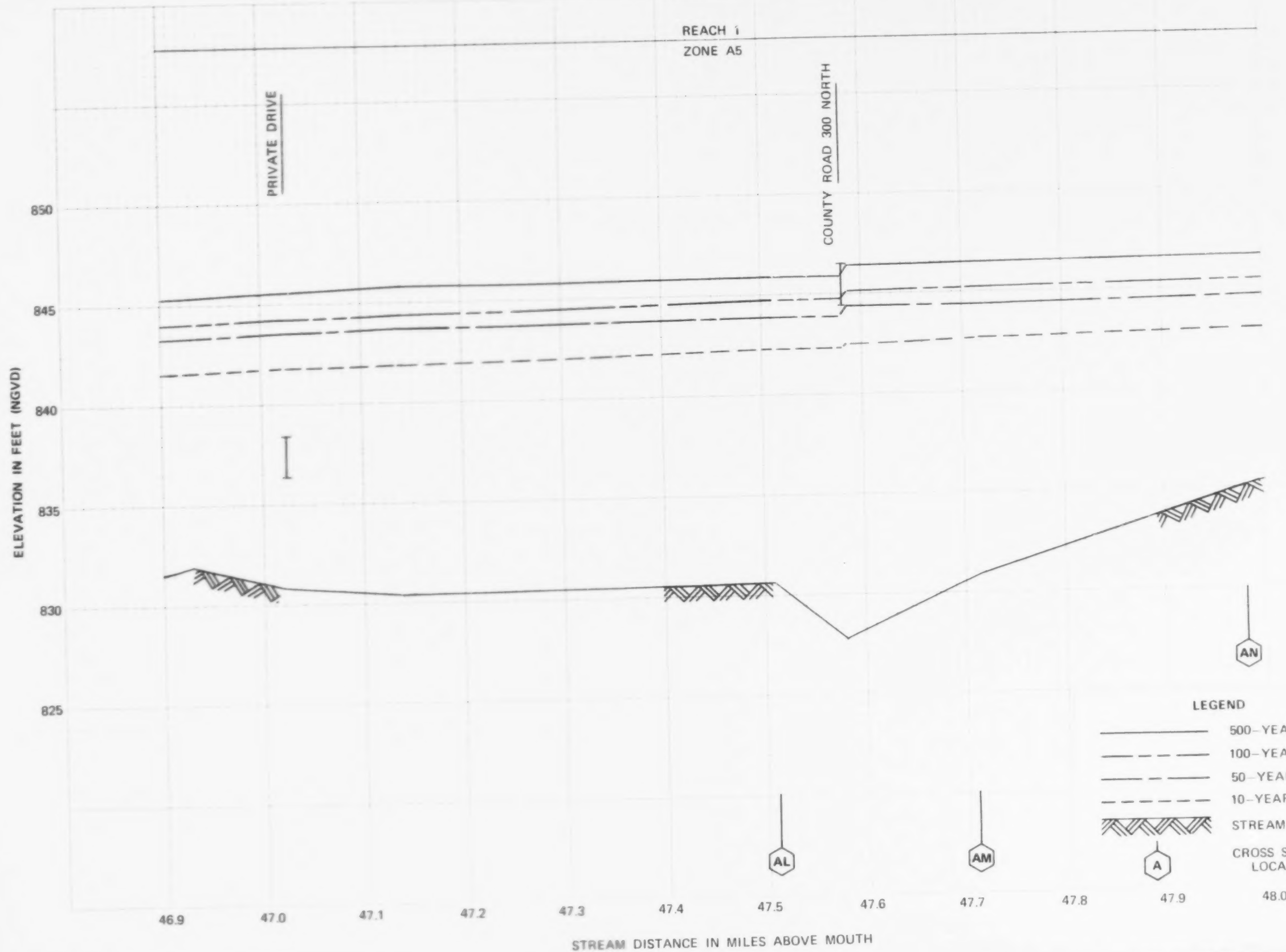
SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

15P

BEST DOCUMENT AVAILABLE



FLOOD PROFILES

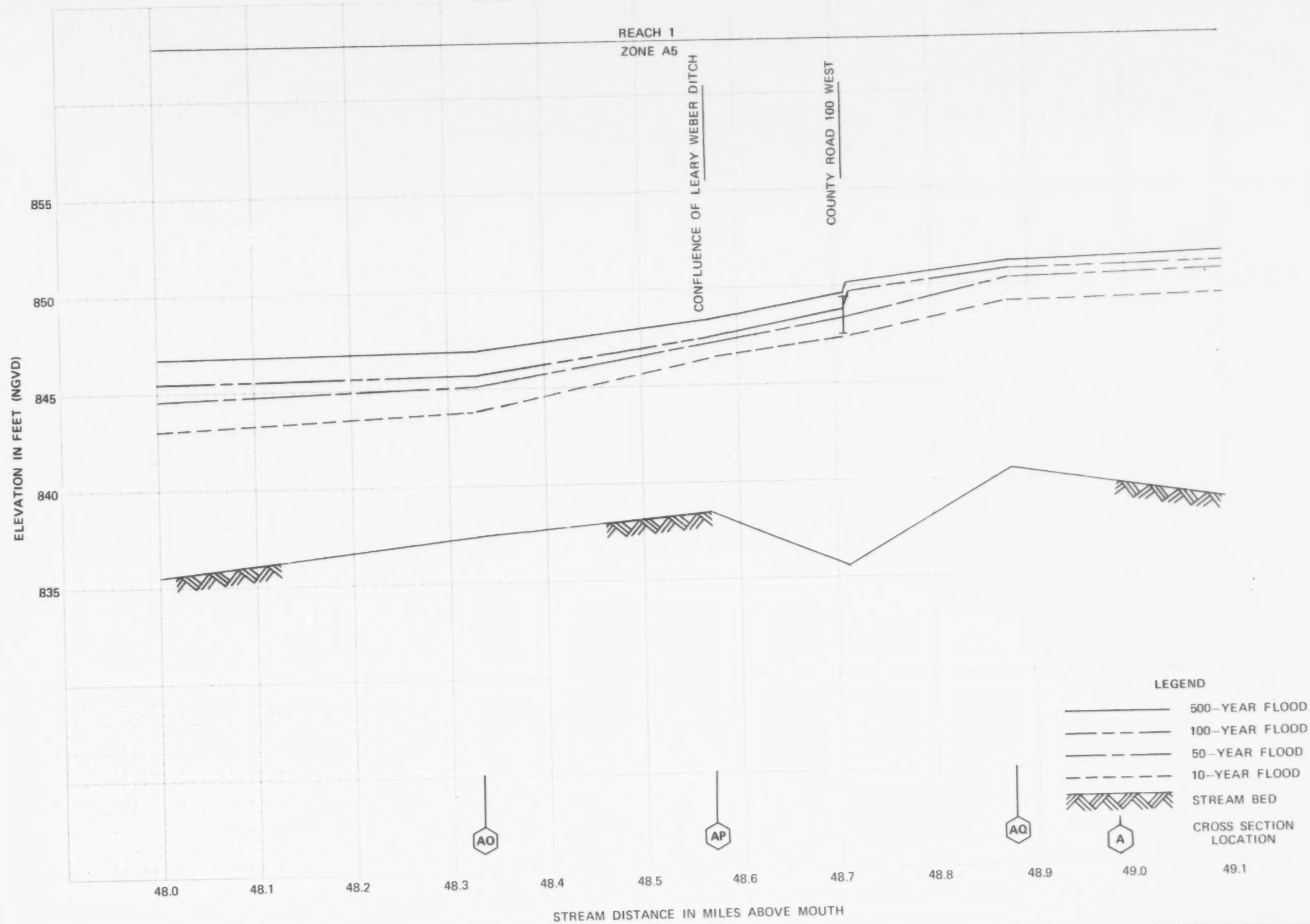
SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

16P

BEST DOCUMENT AVAILABLE



FLOOD PROFILES

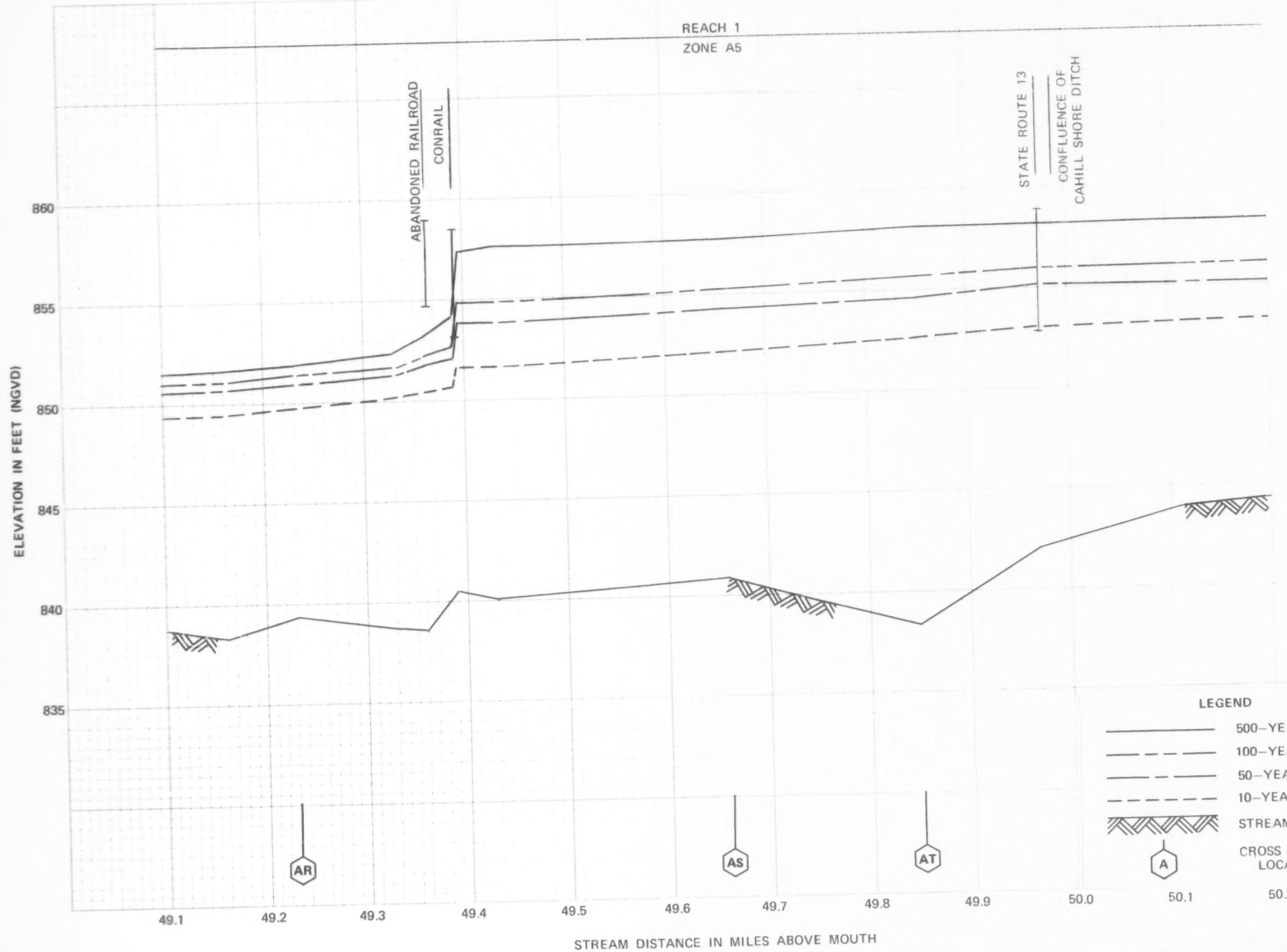
SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

17P

BEST DOCUMENT AVAILABLE



FLOOD PROFILES

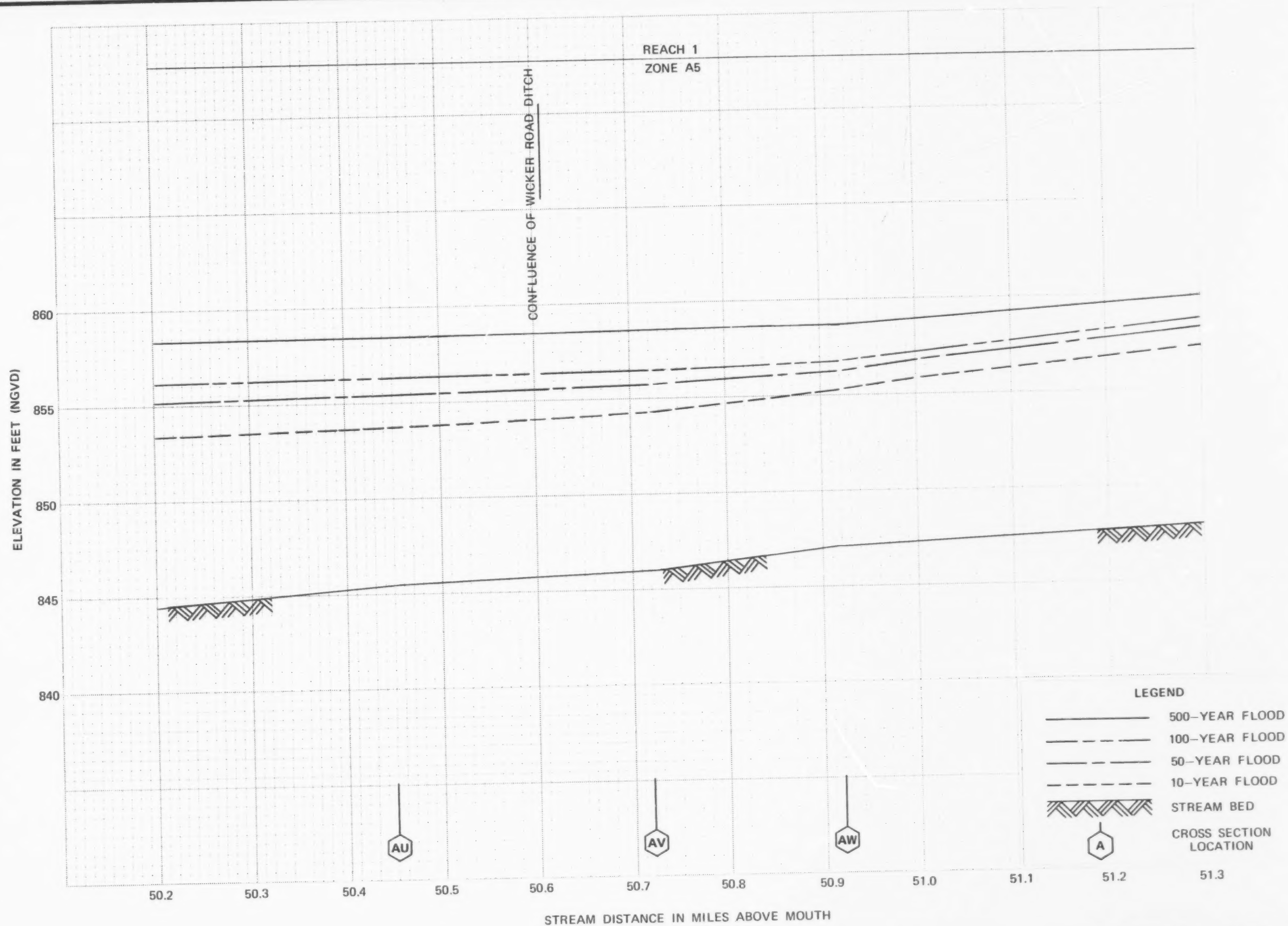
SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

18P

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FLOOD PROFILES

SUGAR CREEK

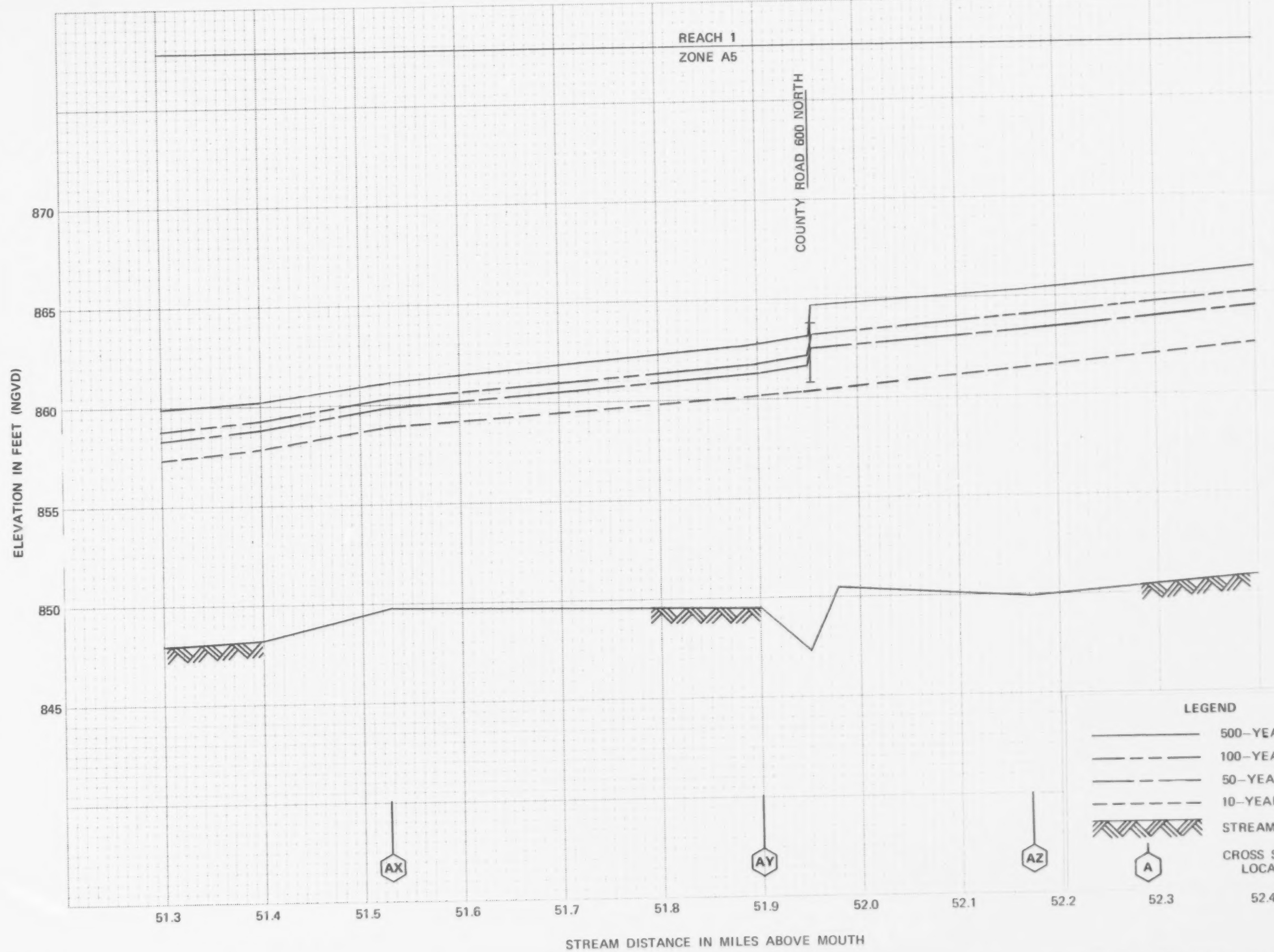
FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

19P

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46



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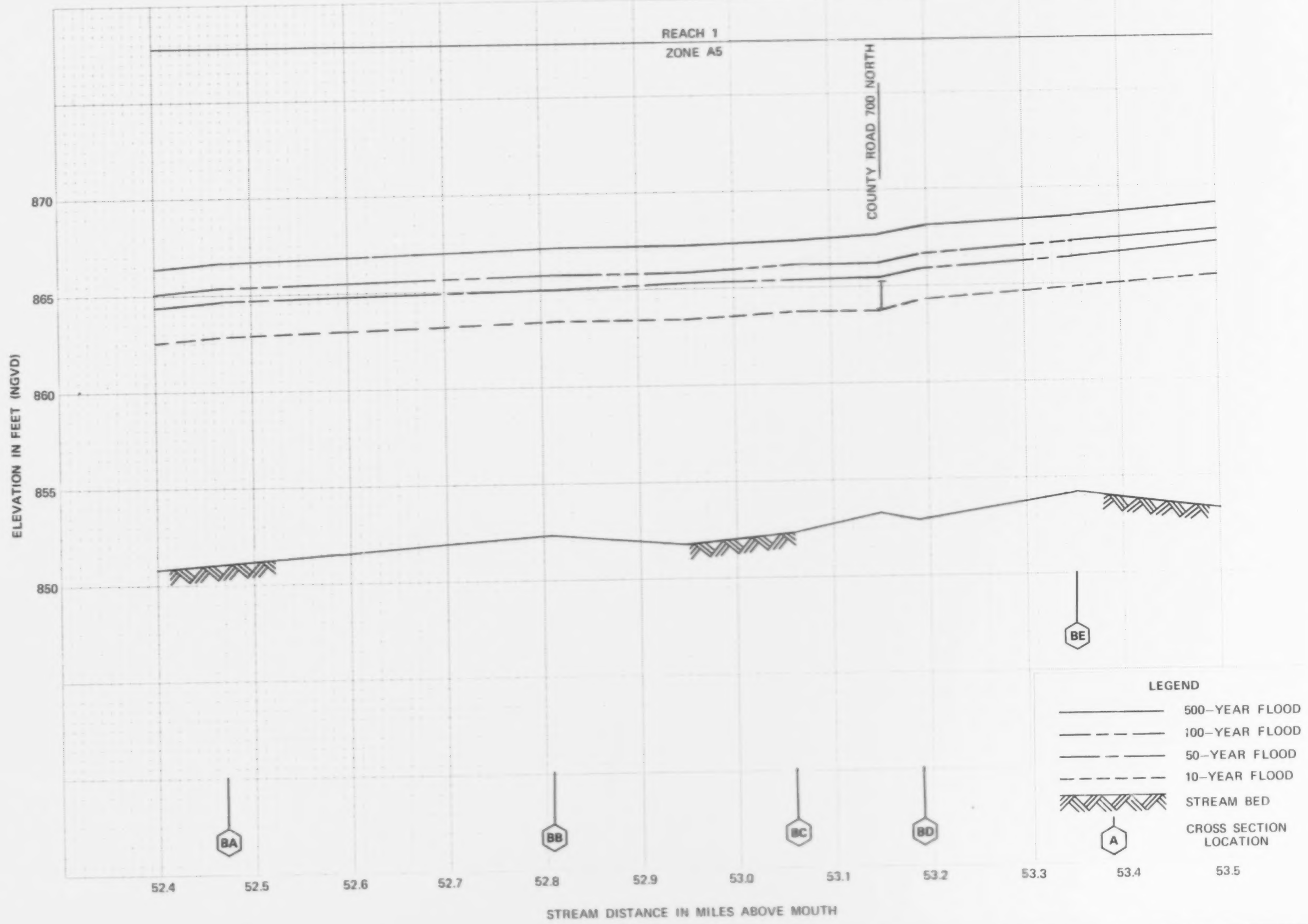
SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

20P

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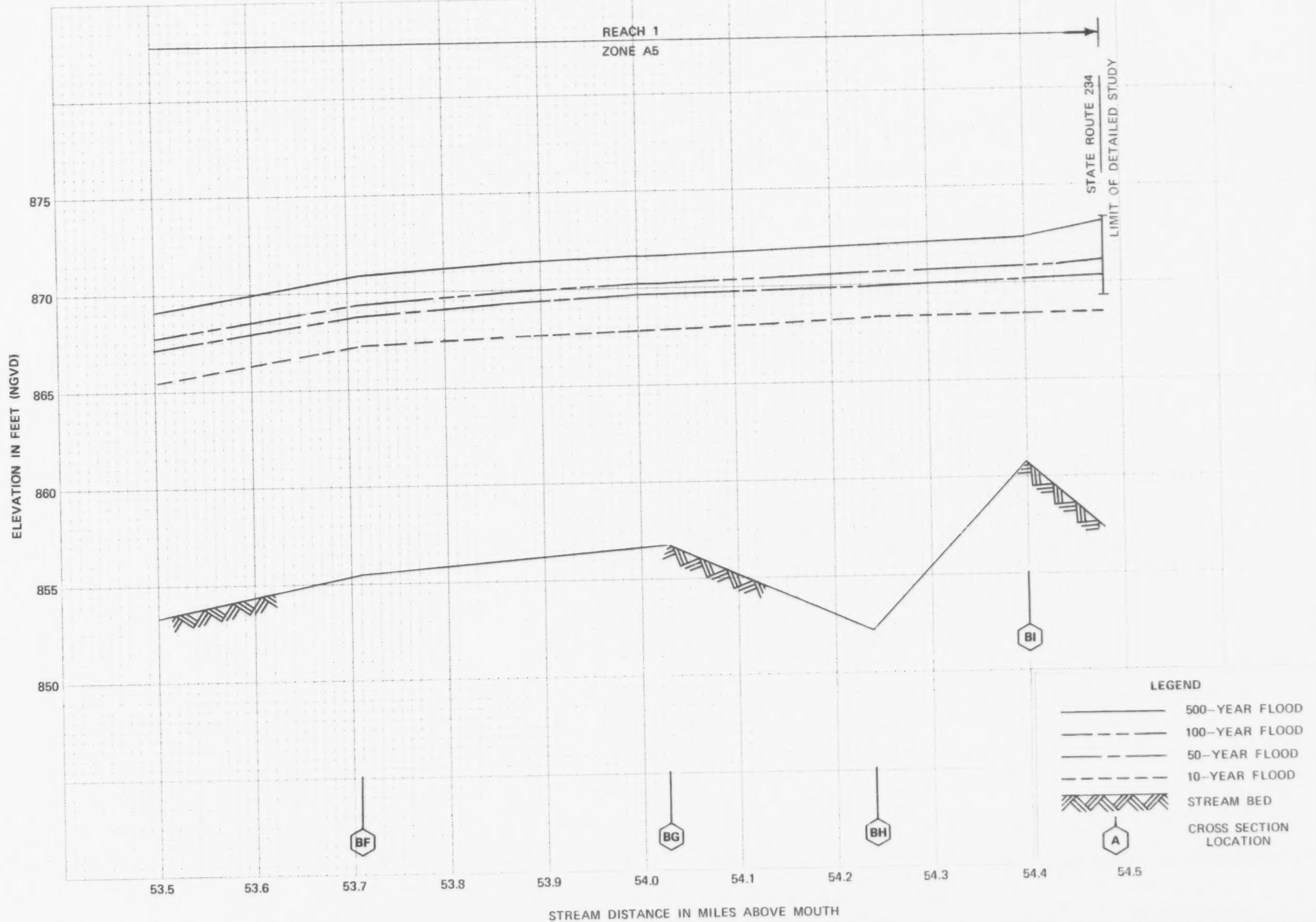
SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

21P

BEST DOCUMENT AVAILABLE



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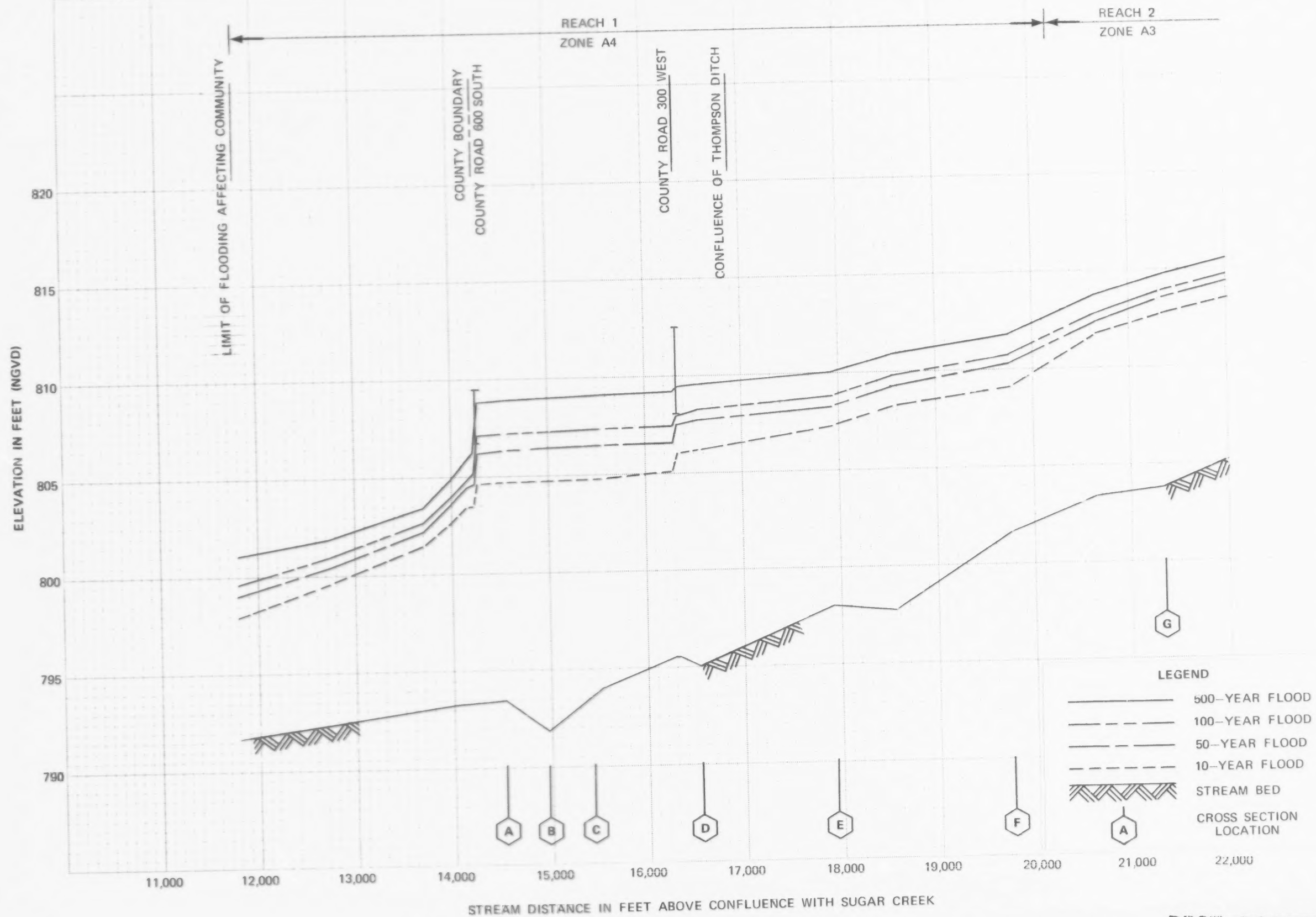
SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

22P

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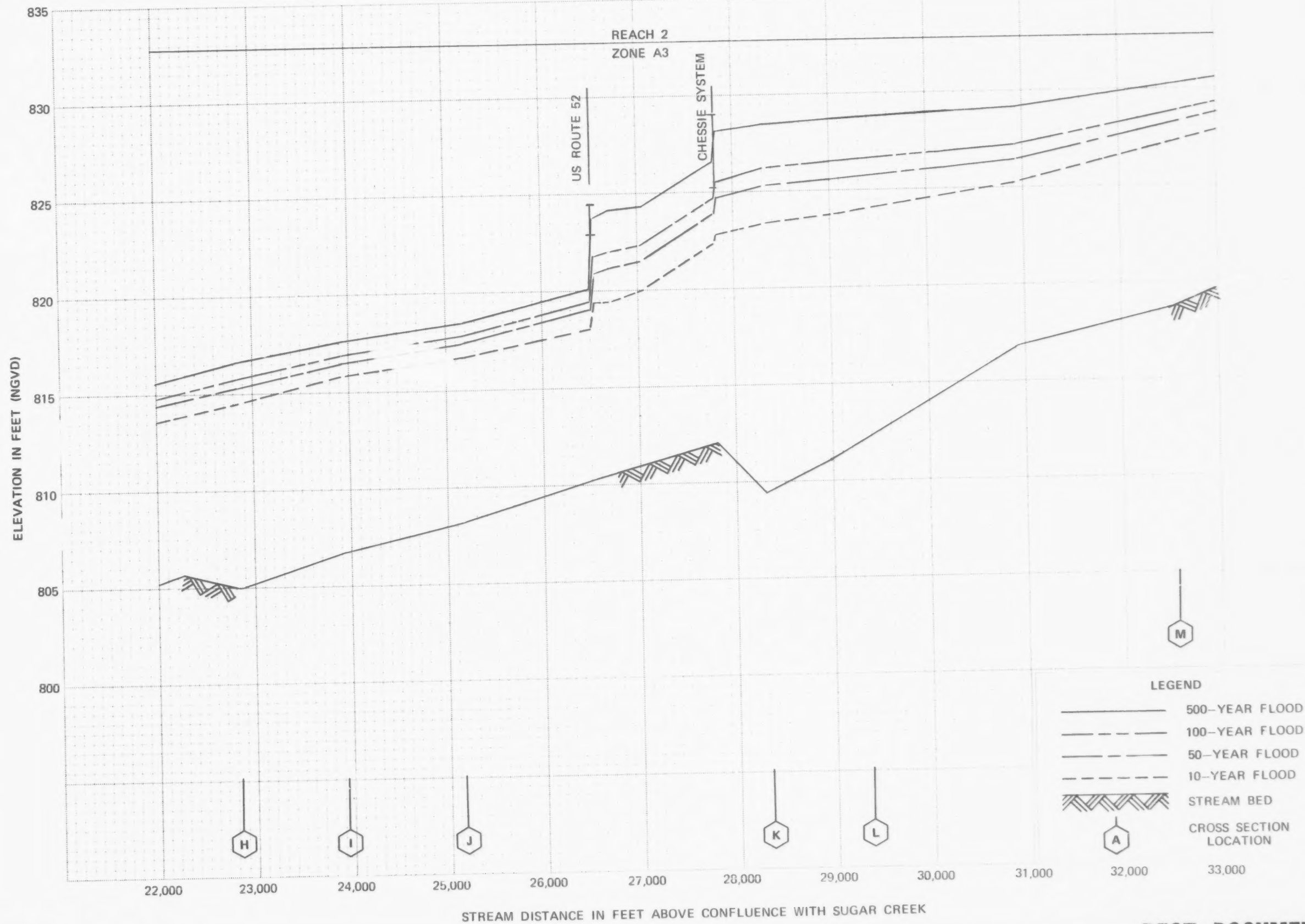


FLOOD PROFILES
LITTLE SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

23P

BEST DOCUMENT AVAILABLE



FLOOD PROFILES

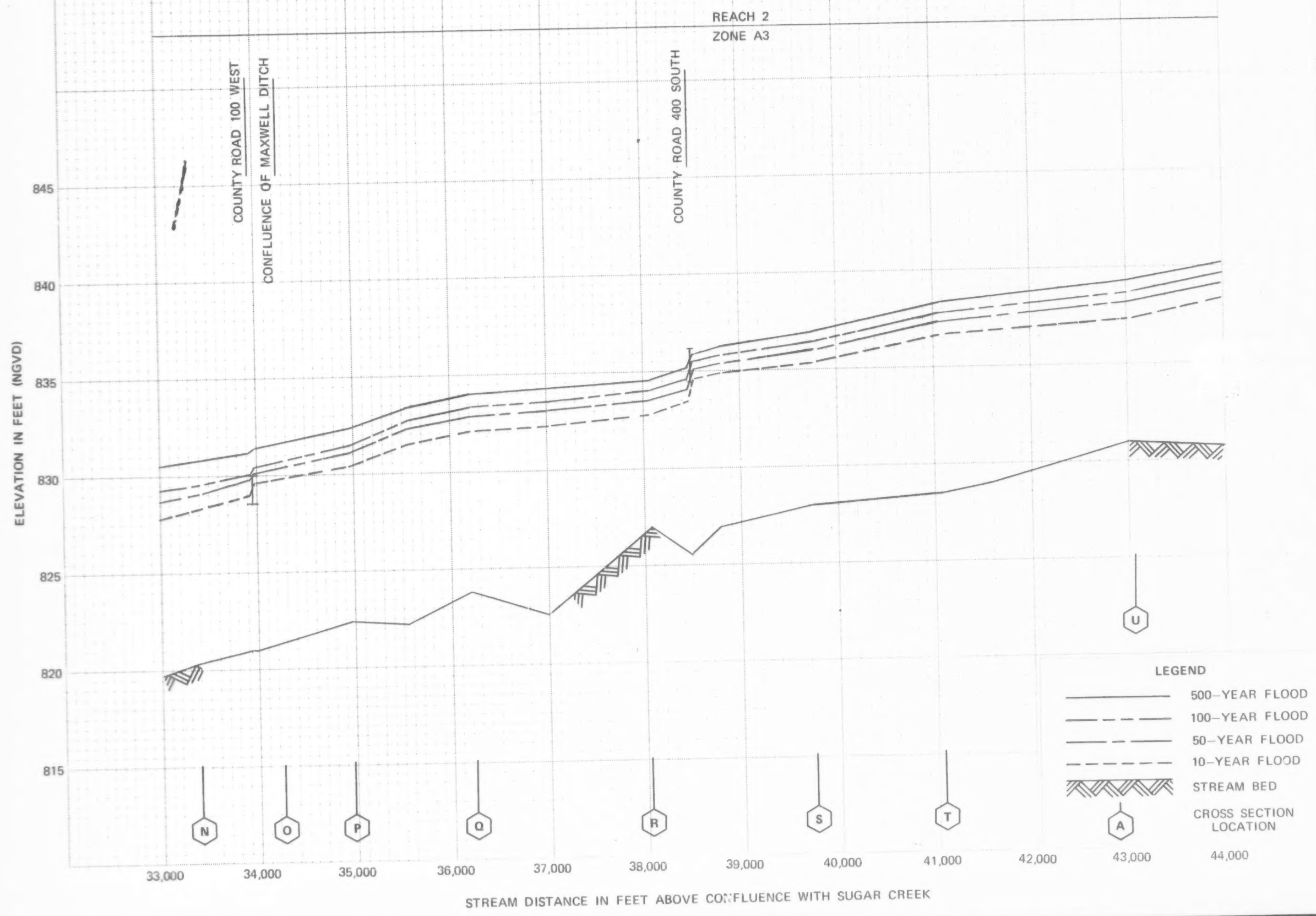
LITTLE SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

24P

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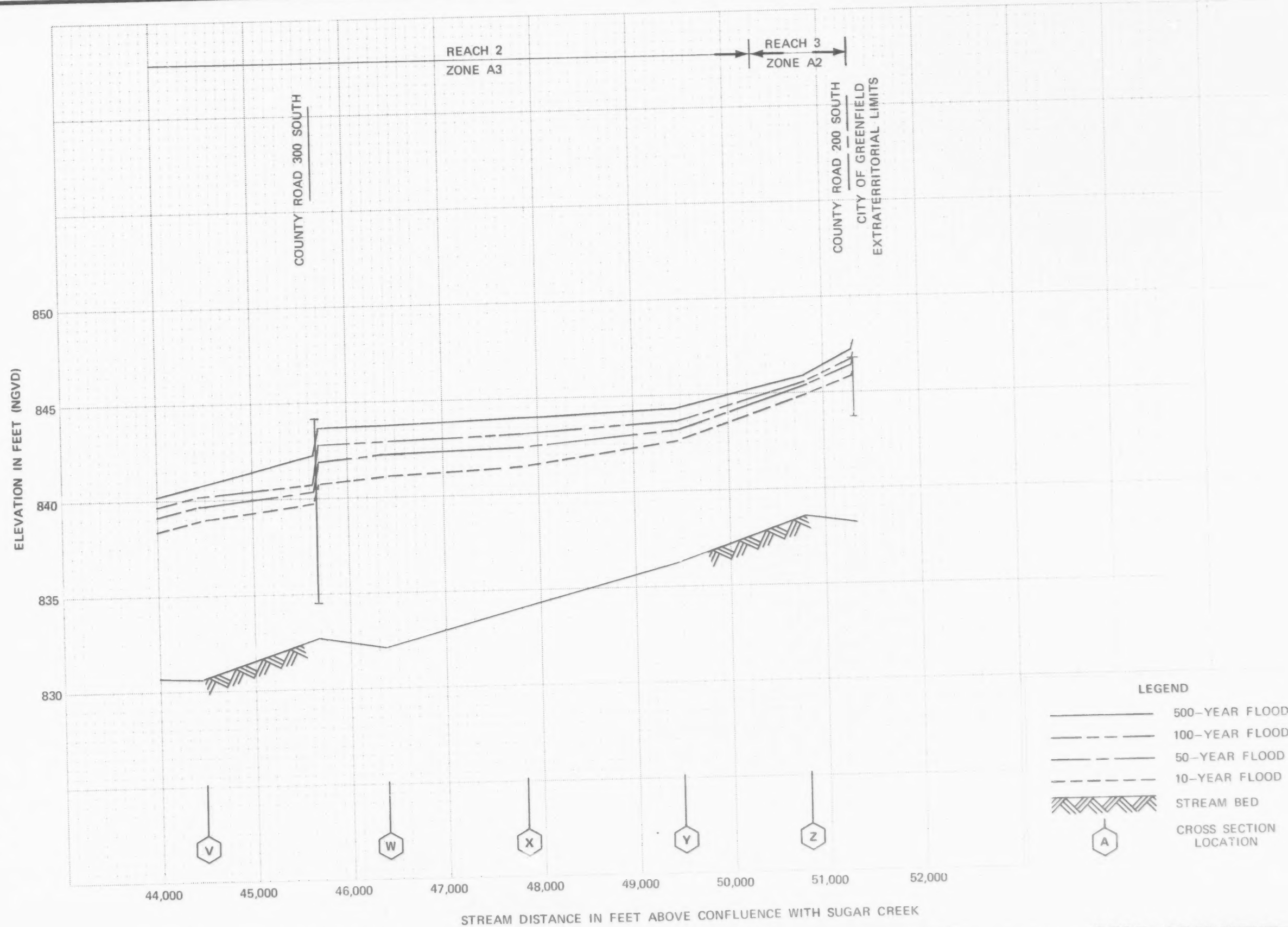


FLOOD PROFILES

LITTLE SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)



FLOOD PROFILES

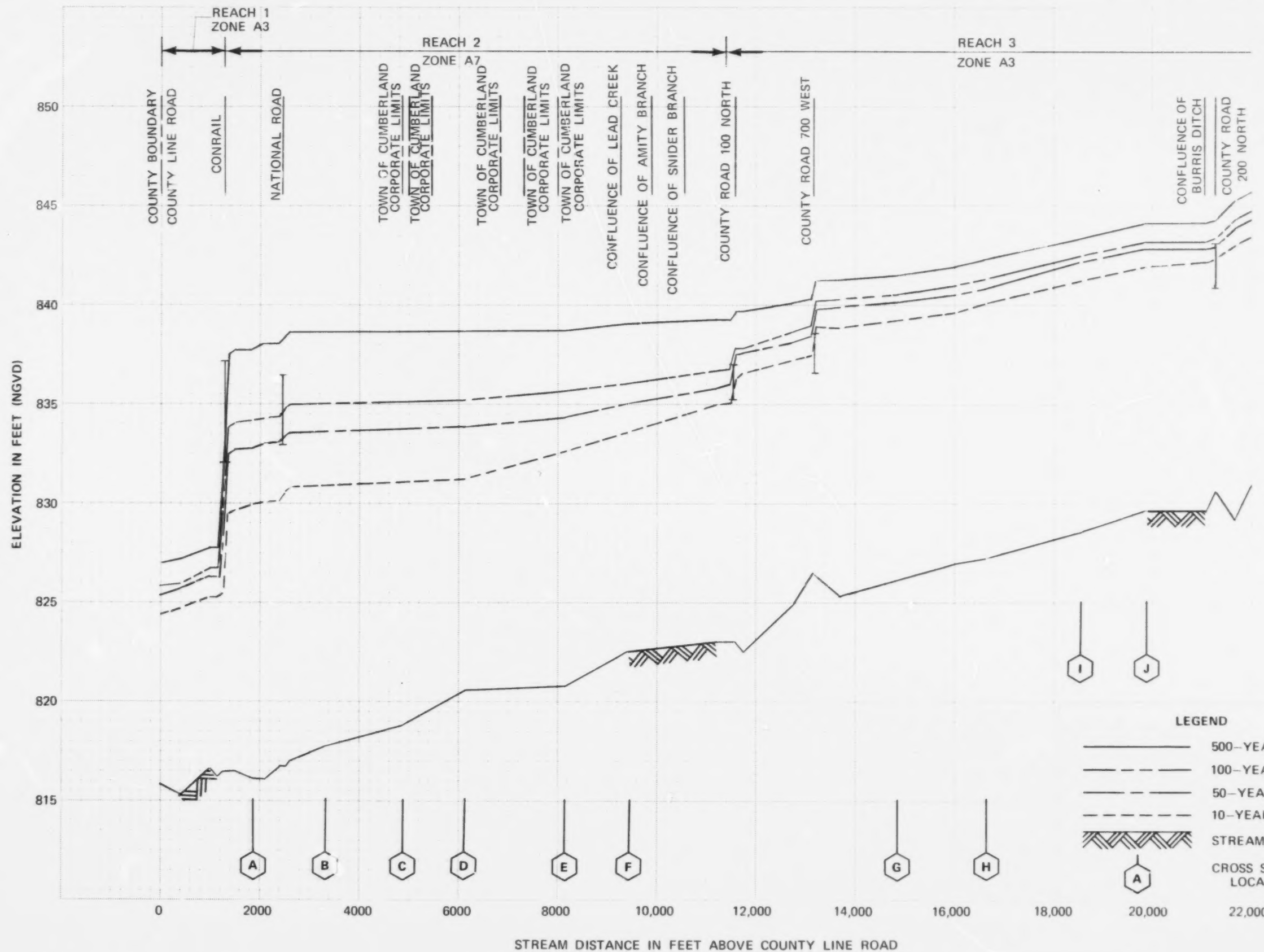
LITTLE SUGAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

26P

BEST DOCUMENT AVAILABLE



FLOOD PROFILES

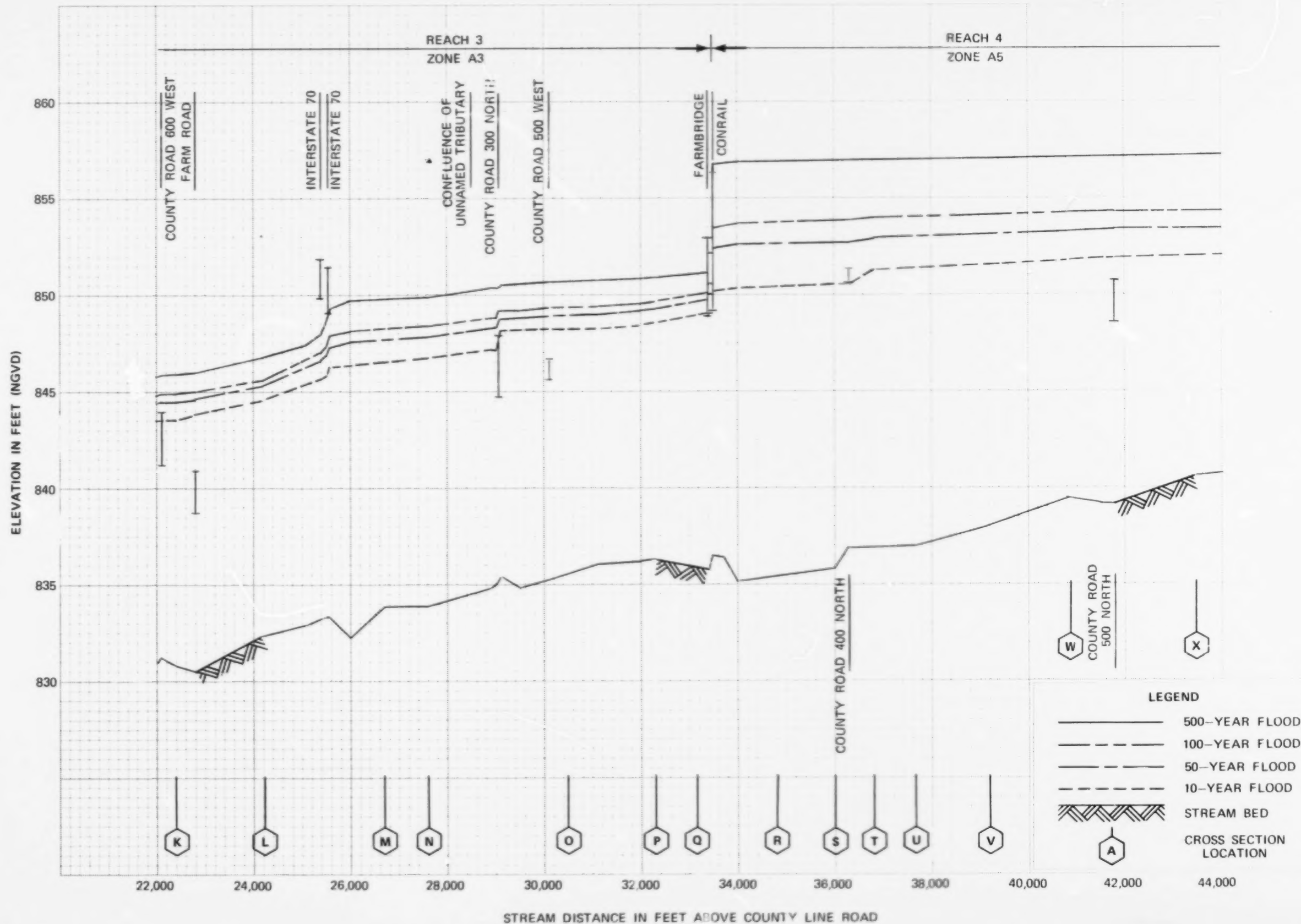
BUCK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

27P

BEST DOCUMENT AVAILABLE



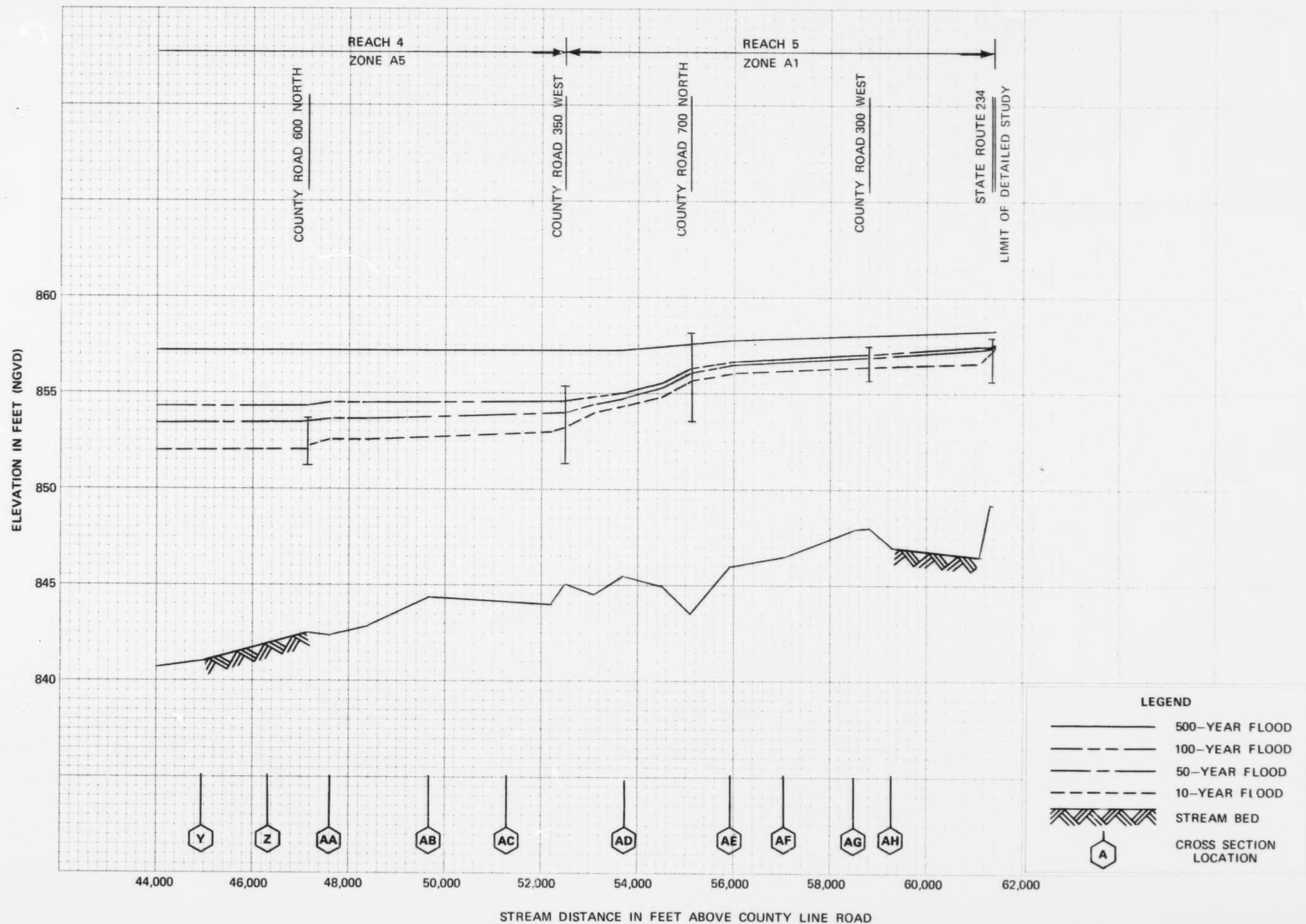
FLOOD PROFILES

BUCK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

28P

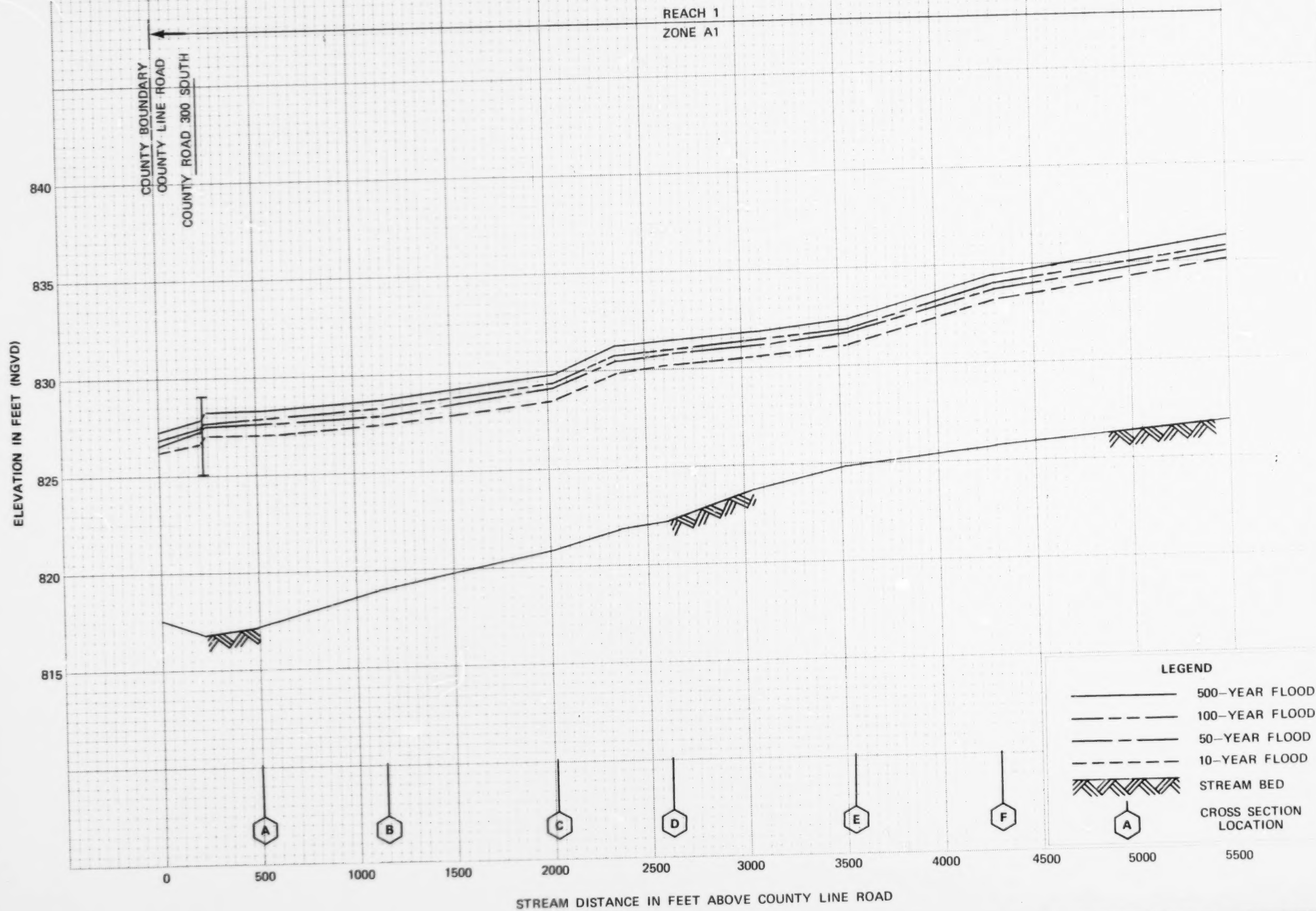


FLOOD PROFILES

BUCK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)



FLOOD PROFILES

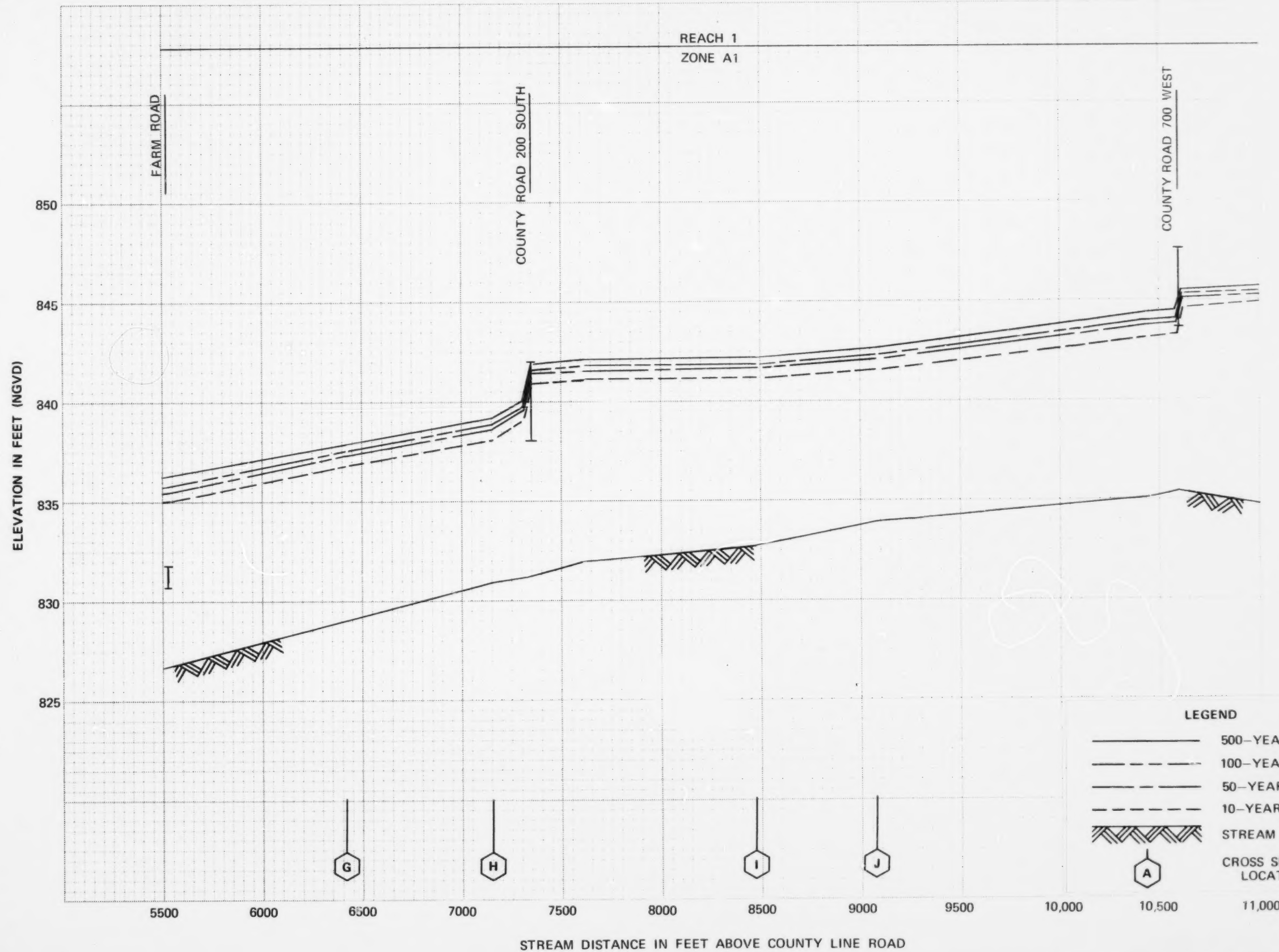
BRIER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

30P

BEST DOCUMENT AVAILABLE



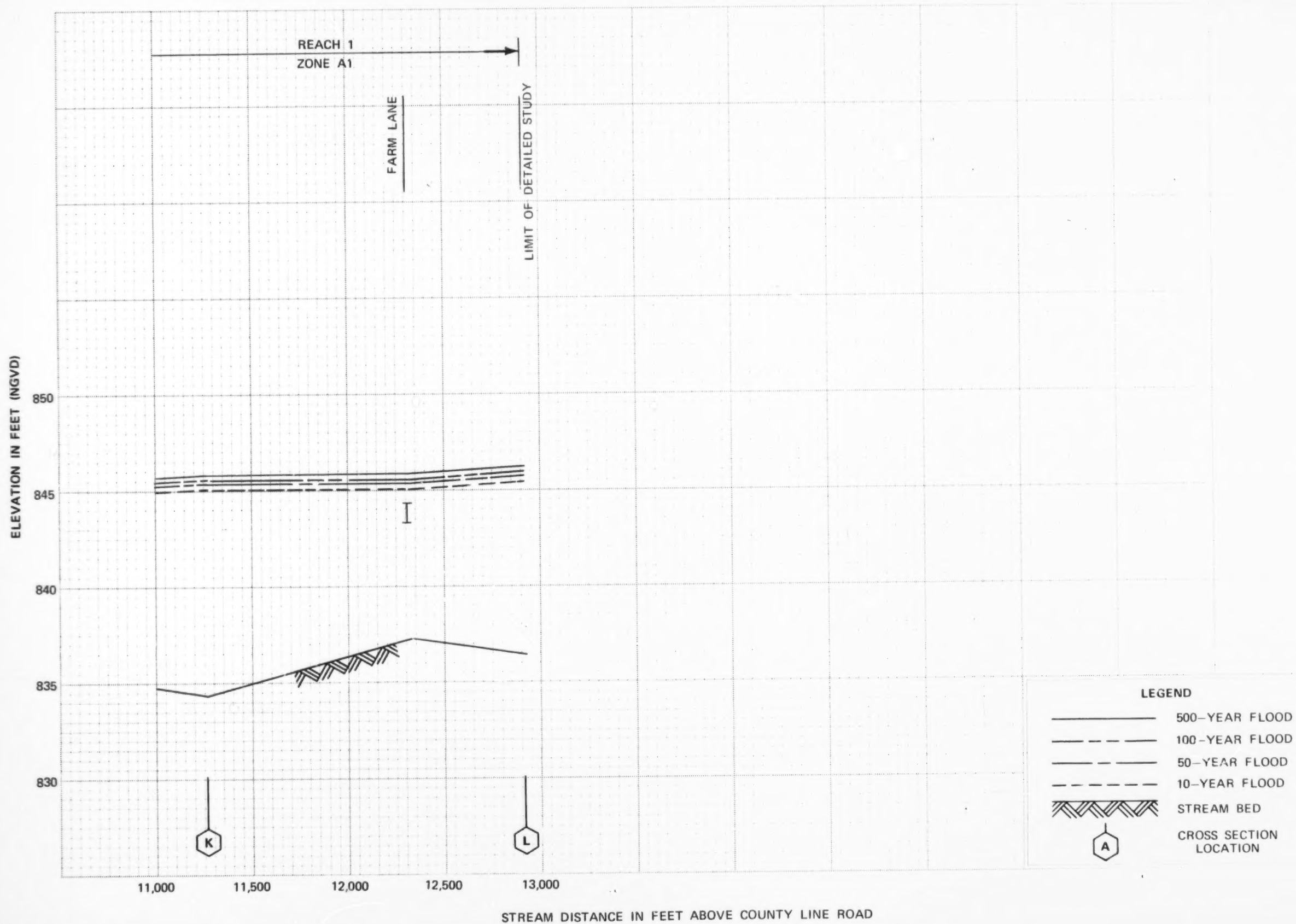
FLOOD PROFILES

BRIER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

31P



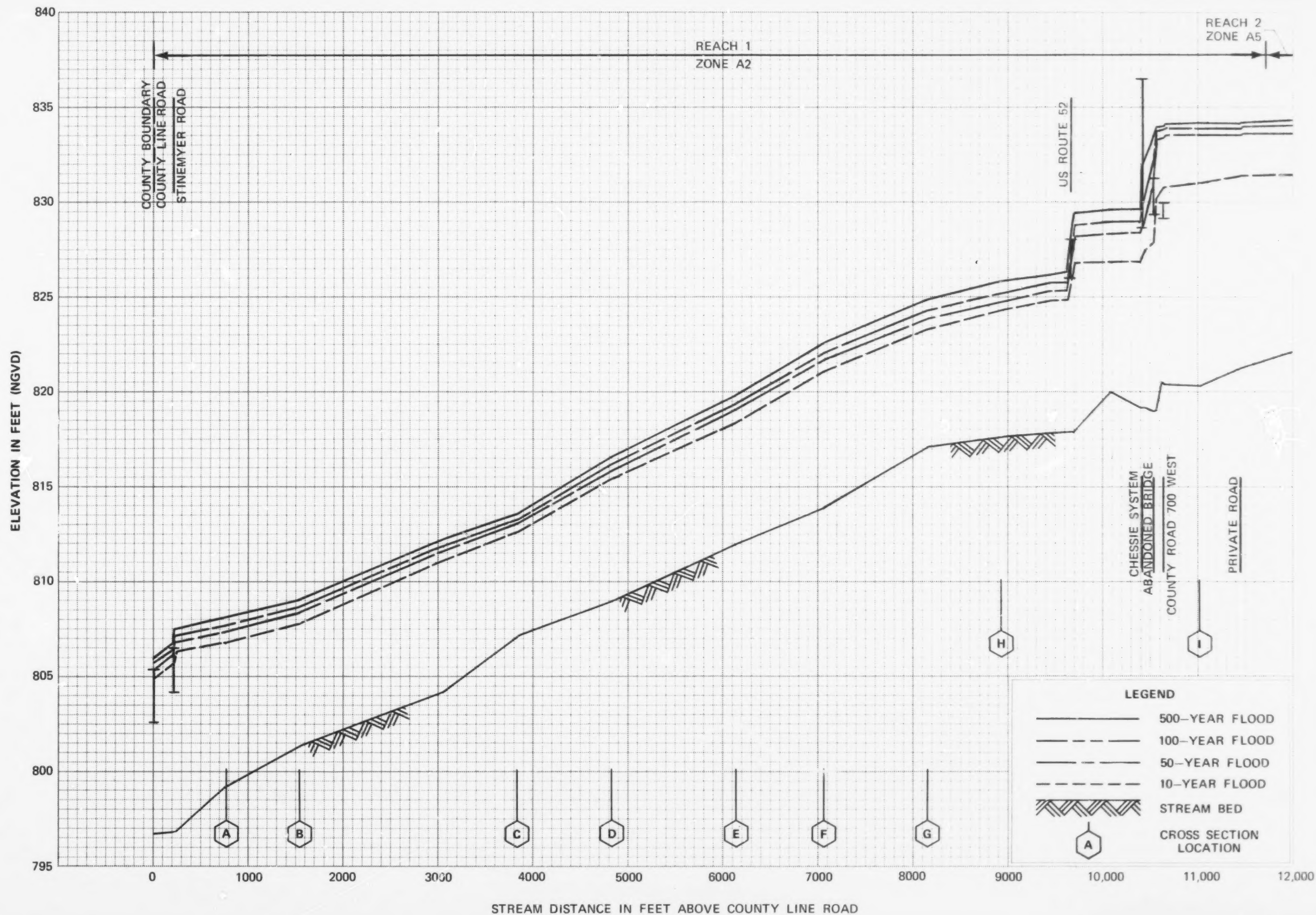
FLOOD PROFILES

BRIER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

32P



FLOOD PROFILES

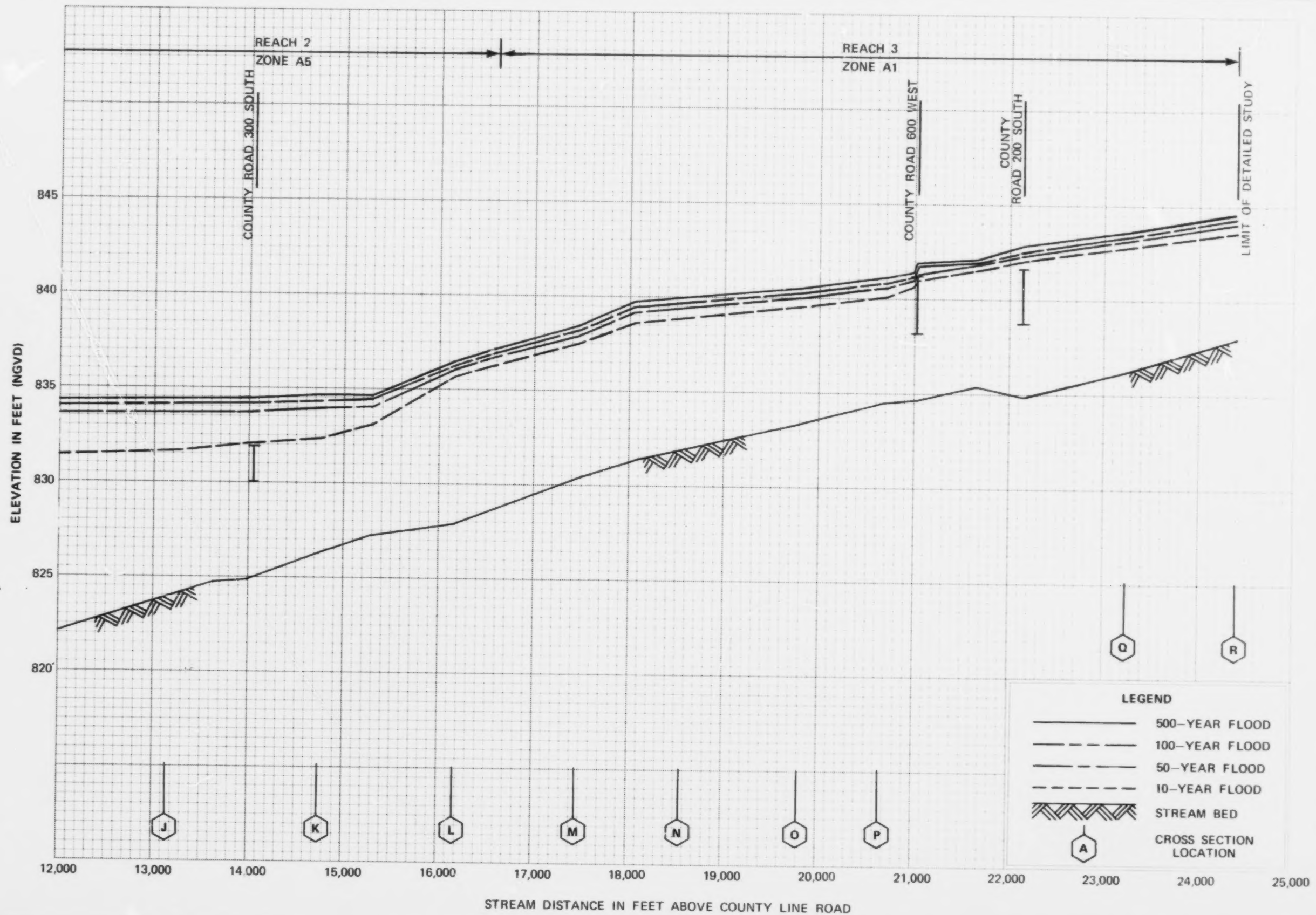
DOE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

33P

BEST DOCUMENT AVAILABLE



FLOOD PROFILES

DOE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF HANCOCK, IN
(UNINCORPORATED AREAS)

34P